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Manual and Industrial Arts Organization of an Administrative Type---The Equipment Budget

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(Tenth Article)



SECOND important part of making a budget for a department of industrial arts is the estimating of equipment and its cost. As in the case of determining supplies, so in reaching conclusions with reference to equipment, the first consideration is the available means. The means may depend very largely upon needs; hence, before a superintendent recommends or suggests to his board of education a tentative or maximum sum to be set aside for a department budget, the supervisor should give him a general idea of the department needs and receive from him a suggestion as to what the action of the board may be if too large a request is made. Then, too, this conference between supervisor and superintendent is a natural business one. As a colleague and, in a certain sense, the subordinate of the superintendent, the supervisor owes it to the superior officer to confer with him and obtain from him any necessary instructions. The supervisor is often saved some embarrassment, too, by having first received instructions from the superintendent regarding the possibilities of the budget. In no case, however, should it be true that the superintendent should dictate to the supervisor the kind of equipment to specify. He may with perfect justice, however, dictate with reference to quantities or advise with regard to relative developments. This information makes it possible for the supervisor to adjust himself to the conditions about which he may have known nothing previous to his conference with the superintendent. The needs of his department then may be safely determined upon the basis of fact.

The study of annual inventories will reveal facts of great assistance to the supervisor when he makes out his equipment budget. If the inventory for a year has been carefully kept to record losses, breakage and future needs and if these items of information were recorded when first known, namely when the active inventory records were made, all budget items for equipment except those for new equipment will be known. The new equipment then will be included in the budget or not, depending upon the conclusion reached at the conference between the supervisor and the superintendent.

Perhaps the first step to be taken by a supervisor in developing a new equipment budget is to consult bulletins, articles, prepared by educational experts upon the subject of equipment. These men presumably have had years of experience in the use of equipment and have consulted many users of certain types of equip-

ment regarding good and bad points. When they prepare bulletins on the subject of equipments, therefore, they are likely to give the result of valuable research. The novices in purchasing equipment may well afford to take advantage of these results.

The educational expert, however, may not have certain data which any purchaser of equipment should possess. He may not know the mechanical efficiency of equipment. He may be prejudiced in favor of certain types or makes of tools and apparatus because of his own experience or the opinions of his professional friends. The "talking points" of a machine for example, are not confined to the usage of the machine. The mechanical construction of a machine is perhaps its first "talking point." Information of this sort can best be obtained from manufacturers or salesmen. The information to be gained from salesmen should be sought and catalogs should be consulted by the prospective purchaser of equipment. It should be remembered, however, that the principal business of these individuals is to sell goods, consequently the purchaser in justice to himself, should carefully weigh the arguments of different salesmen each one of whom is selling a *particular* make of some one type of equipment.

When this has been done the supervisor will do well to compare the results of studying the educators' bulletins with the conclusions reached from studying commercial catalogs and consulting with salesmen. He must now, make up a tentative list of equipment or rely upon some particular friend to do this for him. It would seem the better course to reach definite but not necessarily final conclusions with reference to the equipment budget, and then as a last resort to consult some particular friend, than to reverse this process. By taking the first of these courses the friend will need to show cause for changing the list of equipment, whereas, in the other case, he would merely add to the sum total of information gained by the prospective purchaser. The latter would ultimately use the information of the friend as he used all other information in making his final decision. In other words, the first course enables the one who is making up his mind as to the merits of certain equipment to make two presumably final conclusions instead of one. With a definite equipment in mind the one who is making out a budget is next confronted with the task of writing specifications if he is contemplating an early purchase. A specification must be so drawn that it will be interpreted alike by all

readers. The absolute definiteness of a specification is said to make it "fool-proof." It does more than this, however, it makes it impossible of misconstruction. A specification definitely written insures a single result, viz., the proper filling of the future order which, of course, is done on the basis of the specification. Only when the one writing a specification is willing to rely upon the judgment of the one who will fill the future order can he afford to be careless about any part of the specification.

When items specified are so well known that no mistake can be made the name of the item will suffice. For example: Bailey Jack Plane No. 5 refers to one plane only. Usually it is wise to designate an article by using more than its name in the specification. For example: When specifying a chisel, one should give its name, the length of the blade, whether of socket or shank construction and the use to which it is to be put, as: Buck Bros. Socket, firmer framing chisel, with sharpened five-inch blade handled. At times, also, it is well to give the catalog number of a tool or other item of equipment, and the name of the firm handling it.

A properly written specification for a set of individual bench tools and for a woodworking machine equipment is given herewith.

Specifications for Bench Woodworking Tool Equipment.

(Example shows amount of specifying needed.)

Furnish tools as specified:

- 20 Jack planes, ————make, No.—
- 20 Block planes, ————make, No.—
- 20 Back saws, ————make, No.—, 12-inch.
- 20 Marking gauges, ————make, No.—
- 20 ————make, mounted (wood) oil stones, 6 inches by 1 7/8 inches.
- 20 Try squares, 6-inch blade, ————make, No.—
- 20 Steel oilers (coppered), No.—, catalog 1914.
- 20 Wing dividers, 6-inch polished, No.—
- 20 Screw drivers, 4-inch blade, ————make.
- 20 ————make, long dowel bits, 1/4-inch.
- 20 ————make, long dowel bits, 3/8-inch.
- 20 ————make, long dowel bits, 1/2-inch.
- 20 ————make, firmer chisels (sharpened and handled), No.—, 1-inch.
- 20 ————make, firmer chisels (sharpened and handled), No.—, 3/4-inch.
- 20 ————make, firmer chisels (sharpened and handled), No.—, 1/4-inch.
- 15 ————make, spokeshaves, No.—
- 20 Two-foot, two-fold, boxwood rules, ————make, No.—
- 20 ————make, No.— boxwood rules, 12-inch.
- 20 Bench brushes, ————make, No.—
- 20 Bench hooks (pattern of Van Deusen of Bradley Polytechnic Institute).
- 3 Crosscut saws, ————make, No.—, 10-point, 24-inch.
- 3 Rip saws, ————make, No.—, 8-point, 24-inch.
- 1 Screw driver, ————make, 8-inch blade.
- 4 T-Bevels, ————make, No.—, 8-inch.
- 6 Bell faced hammers, ————make, No.—
- 6 Mallets, round hickory, mortised (best second growth), 5 inches long and 33 inches in diameter.
- 4 Ratchet bit braces, 8-inch sweep, ————make, No.—
- 6 Outside ground, firmer gouges (sharpened and handled); one each, 3/4-inch—2 inches by 1/4 inch, ————make.
- 6 Inside ground, firmer gouges (sharpened and handled); one each, 3/4-inch—2 inches by 1/4 inch.
- 2 Framing squares No.—, ————make, catalog ———— 1914.
- 2 ————make, Jointer Planes No.—
- 2 ————make, Smooth Planes No.—
- 1 ————make, Monkey Wrench, 8-inch.
- 1 Oval burnisher, 4-inch blade, ————make.
- 1 Glue pot (electric), ————make, 1914, page —
- 1 Hatchet, ————make, Broad No.—

Machinery Specifications Covering Woodworking Machinery for Manual Training Department,

(Prepared by Arthur F. Krueger, instructor in Manual Arts, Champaign High School, Champaign, Ill. A former student of the University of Wisconsin, Madison, Wis.)

Prices quoted must cover delivery F. O. B. ————, ————. All belts must be guarded with wire-mesh guards and equipment must be all ready to set up and run, by simply placing in position and running in feed wires.

All equipment must be fully guaranteed in every respect. All motors must be ———— make. All electrical equipment must be ———— make, unless otherwise noted.

All starters to be Single Throw Knife Switches, with slate bases, non-arcing fuses, and removable iron covers, conveniently located on frame of machine.

All belts are to be highest grade, short lap oak tanned leather, made endless.

All machines must have special lacquer finish so they will be very attractive in appearance, serving as an incentive to the students to take good care of them.

State number of days goods will be delivered F. O. B., ————, if order is placed with your firm.

We shall use two phase, 110 volt, 60 cycle, alternating current.

Subject—Universal Saw Bench.

Manufactured by ————, ————, ————.
Folder 1, Page 1.

ONE Type "B" Universal Saw Bench complete with splitter and cage guards, motor belt guard, 5 H. P., ————, motor, special motor floor plate for direct connection to machine, one length first-class endless leather belting, F. O. B., ———— (Complete).

Subject—Jointer.

Manufactured by ————, ————, ————.
Folder 2, Pages 2, 3, 4.

ONE Fig. —, 12-inch, No. 1 Jointer. Motor to be 3 H. P., 1800 R. P. M., ————, mounted on base attached to frame of the machine connected to cylinder by cloth pinion and cut cast gear totally enclosed. Machine to be equipped with safety cylinder and ———— Iron Clad Fused Switch, F. O. B. ———— (complete).

Subject—Grindstone.

Manufactured by ————, ————, ————.
Folder 2, Pages 5 and 6.

ONE Grindstone and frame, Fig. —, 36 inches by 5 1/2 inches to 6 inches; motor mounted on special base attached to the frame of machine, connected to arbor by special worm and worm gear, with ———— Iron Clad Fused Switch attached to machine F. O. B. ———— (complete).

Subject—Single Cylinder Surfacar.

Manufactured by ————, ————, ————.
Folder 3, Pages 5, 6, 7.

ONE ———— No. — Single Cylinder Surfacar, to plane one side 24 inches wide and up to 6 inches thick; fitted full round head, with thin, air-hardened "Tungsten" steel knives arranged to take feed from the cylinder. Fitted with one cast iron motor pedestal, and one 5 H. P. 3600 R. P. M. ————, motor directly coupled to cylinder of surfaces with ———— Flexible Insulated coupling, with enclosed starter, one set of belts and one set of removable wire mesh belt guards F. O. B. ———— (complete).

Subject—Emery Wheel Grinder.

Manufactured by ————, ————, ————.
Folder 3, Pages 12, 13.

ONE ———— No. — Emery Wheel Grinder, mounted on column, with rest, as illustrated and described in bulletin, including two emery wheels; grinder to be fitted with 1/2 H. P. 1800 R. P. M. ————, Motor, an enclosed starter and belt guarded with a wire mesh guard F. O. B., ———— (complete).

Subject—Jointing and Setting Device for Surfacar Knives.

Manufactured by ————, ————, ————.
Folder 3, Page 6.

ONE ———— Jointing and Setting Device for No. — machine F. O. B., ———— (complete).

Subject—Motor Driven Speed Lathe.

Folder 5, Pages 5, 16, 16 1/2.

ONE No. — Motor Driven Speed Lathe, swings 12 inches over bed, and turns 24 inches between centers, has bed 48 inches long, with special motor bracket, with foot-lever control, and 1/2 H. P. ———— Motor with four-step driving pulley endless leather belt and enclosed snap switch.

Equipped with one $\frac{1}{4}$ inch spur center, one $\frac{1}{2}$ inch cup center, one conical center, one $2\frac{1}{4}$ inch screw chuck, one 6 inch face plate, one 6 inch and 12 inch hand tool-rest with rest holder and clamps. Switch box to be on end. F. O. B., — (complete).

Subject—Bandsaw.

Manufactured by —, —, —.
Folder 5, Pages 3, 6, 6A.

ONE — No. 17 A Bandsaw, with metal wheels, 30-inch diameter cast iron table arranged for tilting to the right and left, and patent roller guides above and below the table, square guide post with saw guard, one $\frac{1}{2}$ inch saw blade, brazing tongs and clamps, to be a right-hand machine; to be guarded with wire mesh door guards for upper and lower wheels; belt to be best oak tanned leather belt 3 foot center; saw to be fitted with a 2 H. P. — motor; motor to be set on floor directly in back of band-saw. F. O. B., — (complete).

Subject—Hollow Chisel Mortising Machine.

Manufactured by —, —, —.
Folder 4, Pages 2, 3, 4.

ONE No. — Foot Lever Feed Vertical Hollow Chisel Mortising Machine, with capacity to operate chisels from $\frac{1}{4}$ inch square up to $\frac{3}{4}$ inch square, with stroke adjustable up to 4 inches deep. The Compound Table to have vertical, transverse and angular adjustments and longitudinal feed by hand wheel and with a clamp for holding the work. Also to be provided with a six-foot stop rod with six adjustable lay-out stops; an auxiliary back stop to be fitted for extra high work; a fan blower to be built into the frame of the machine with its outlet near the cutting point of the chisel to keep the face of the work clear of chips. The Equipment to consist of one each $\frac{3}{8}$ inch and $\frac{1}{2}$ inch hollow chisel with bits, set of chisel and bit bushings and wrenches. Also, all belting put on endless, and a wire mesh belt guard. Machine to be self-contained, with an attached motor base for direct drive by a 2 H. P. motor running 1800 R. P. M. The above mortiser to be furnished with motor as follows: 2 H. P. — Form K, 110, 2 phase, 60 cycle, 1800 R. P. M. Induction Motor, mounted on the extended foot of the mortiser frame and fitted with special two face pulley for driving to bit spindle and fan. F. O. B. — (complete).

The specifications given for tools and machines serve a double purpose. First, the items listed represent standard equipment in quantities sufficient for the needs of ordinary classwork designed both for general educational and specific industrial ends. Second, the amount of specifying enables one unfamiliar with the material, such as a purchasing agent or a business manager for a board of education, to purchase intelligently without risk of being fooled.

In the case of the lists for tools and machines, it has seemed best to omit the firm name for each item. In sending the specifications to prospective estimators, the name of the firm to whom a set of specifications was sent or the name of some other firm manufacturing a particular machine, would be used where the dashes appear following the number of the machine.

Specifications should be duplicated and sent only to those whom it is desired will make estimates. When these estimates are all in they should be inspected carefully and one should be tentatively selected by the man who prepared the specifications. He, presumably the supervisor, will then forward to the superintendent all of his correspondence regarding specifications and all estimates upon the same, and his recommendation regarding the particular estimate which he desires chosen. This procedure insures confidence in the supervisor and at the same time commands the support of those to whom he is responsible in case any difficulty arises consequent to placing the order.

With the authorization of the superintendent, or School Board, the supervisor may place the order. In doing so, he will be courteous to all estimators if he will

notify the unsuccessful ones of the fact that their estimates were received and duly considered, but that the order is being placed with another firm. The reason for the selection of a bid may sometimes be given in such letters of notification.

In writing the order a good form is one which suggests the real purchaser. For example: "I am authorized by the Board of Education of — to order from you the following list of goods as per your estimate of — based upon the specification sent you on —." Then follows the original specification or a copy of the same. The estimate will usually fix the terms of settlement and whether goods are to be sent F. O. B., point of shipment or point of delivery.

Goods should be inspected at the earliest possible date following delivery. Their condition should be reported to the shippers at once. In case of an error, its nature should be made clear and if certain items are being returned a statement to this effect should be made. When a final settlement is reached and all goods are accepted the invoice should be signed and forwarded to the superintendent for necessary memoranda in making payment. The goods should be put in proper condition for use and a record of them made on the department inventory.

It is not always within the province of the supervisor to demand purchase thru a particular firm. Quite often it will be deemed expedient by a board of education to place an order with a local concern. This may cause some inconvenience to the supervisor but unless he can show conclusively that it would be wise to order thru someone else or directly of the manufacturers, or thru a responsible jobbing house, he will show good diplomacy in conforming to the wish of the board of education.

The supervisor, however, is employed as an expert. He should have authority, therefore, in the selection of equipment and should demand that the items specified, when the specification has been approved by the board of education, be purchased.

The order of events in preparing an equipment budget and carrying thru to a conclusion the purchase of a bill of goods, is summarized as follows:

1. Ascertain available means.
2. Determine upon the greatest needs.
3. Consult with superior officer as to probable board action upon budget.
4. Study professional literature.
5. Study commercial catalogs and consult with salesmen.
6. Make out tentative budget.
7. Secure final judgment of professional friend and alter budget if desirable.
8. Write and recommend specification.
9. Submit specification to selected firms.
10. Select estimate and make recommendation to board of education.
11. Write and place order.
12. Accept or reject goods and report upon same.
13. Put goods in proper condition for use, inventory them and forward signed invoice to superintendent or board of education.



Fig. 4. Completed Mat Unmounted.

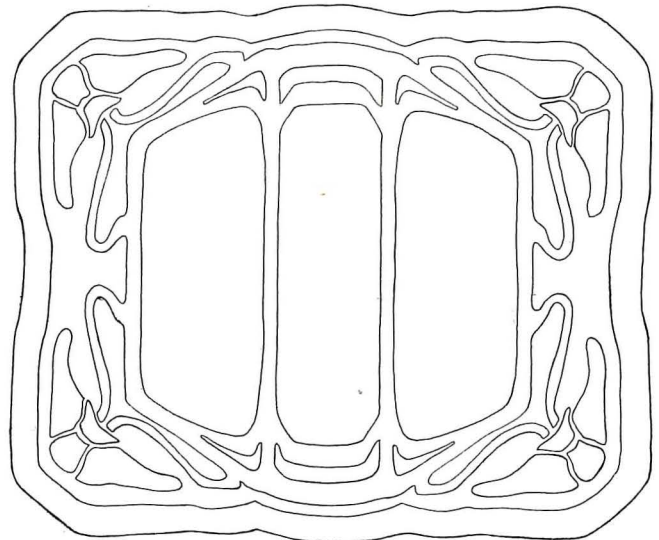


Fig. 1. Design for Unmounted Mat Described.

LEATHER MODELING

Suggestions for Holiday Gifts

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THE modeling of leather and making it up into beautiful things is a kind of work, which could be made a good deal more of in connection with the various lines of art and industrial work. This work is peculiarly rich in material for the student of design, and abundantly repays great care in design and workmanship, in the beauty and commercial value of the finished product.

Since leatherwork requires almost no equipment, it is very inexpensive, provided the worker does his own mounting or making up into various articles as suggested here. The extension of such work has been hampered by the fact that it has been quite generally the custom to have the mounting done in professional shops after the leather has been modeled. This, of course, makes it too expensive for general use. However, the person who is painstaking and who will devote sufficient care to the execution of each piece, will be able

to make numerous objects of considerable value in a reasonable length of time.

To make a proper design for modeled leather work, it is necessary first to know what the main features of the work are. Therefore, it should be said just here that in this kind of leatherwork, the design is first modeled in modeling clay on the back or "wrong" side of the leather. The modeling of the leather then consists in forcing the leather with a tool down from the top around the edges of the clay model. Since this is so, it is clear that delicate lines and very small surfaces are to be avoided, especially in the first work. Bands or spaces as large as consistent with the size of the object and the general character of the design should be planned.

Small Unmounted Mat.

Having worked out a design as shown in Fig. 1, according to the above statements, a piece of calf skin of the desired color is cut about an inch larger than the

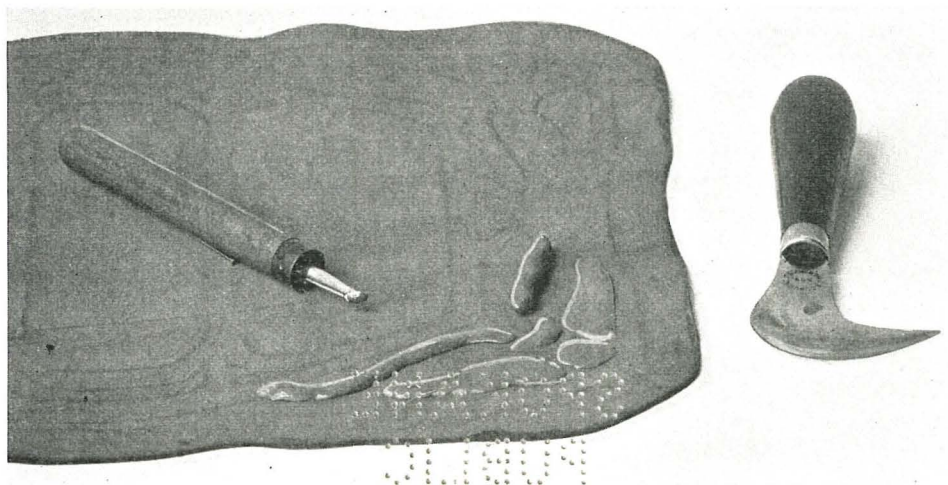


FIG. 2. TOOL, KNIFE, AND CLAY MODEL OF DESIGN.

design to allow for fastening with tacks while tracing the design and for trimming. With a piece of absorbent cotton saturated with water, the smooth surface of the leather is thoroly moistened. The paper bearing the design is placed over the leather and a piece of carbon paper is placed under the leather and all are fastened to a drawing board by means of thumb tacks stuck thru the surplus margin left for that purpose. Then the design is gone over firmly with a smooth, sharp lead pencil or other instrument. This leaves the design pressed into the smooth surface of the leather and it is transferred by means of the carbon paper to the back. Pencil marks must not appear on the smooth or "right" side of the leather. Care must also be taken to pre-

Then with the fingers, the roll is pressed down and somewhat flattened, and the sides are forced down firmly against the leather (Fig. 2). When this is done, the parts of the composition which almost surely go over the lines of the design are removed by running the tool along the lines and thus cutting off the projecting parts. When a larger space is to be modeled, a portion of the composition is pressed down in the central part of the space and other pieces added and pressed down until the lines are reached. When the composition has been treated in this way, it assumes a regular curve rising to its greatest height at the center of that particular part of the design.

A piece of paper is placed firmly over the modeled

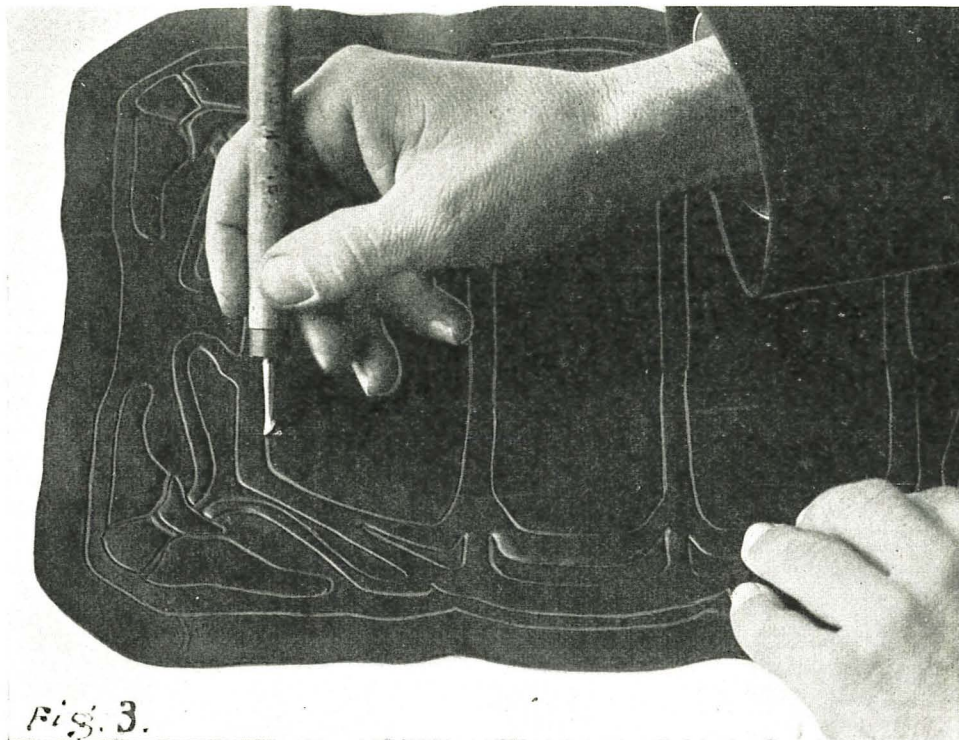


Fig. 3.

FIG. 3. TOOL IN ACTUAL OPERATION.

vent the smooth side of the leather from being soiled by the carbon paper.

Another but more difficult method of transferring design to the back of the leather is sometimes used. The leather is thoroly moistened again after design has been traced on smooth side. The smooth side is kept upward while a soft lead pencil is used to trace the lines on the under side. At the slightest touch of the pencil on the under side, there appears a whitish place on the upper or smooth side of the leather, thus making it possible to trace the design without at all being able to see the pencil.

After the design has thus been placed on both sides of the leather, the modeling of the design in modeling clay is in order. Only a part of the design is modeled at one time in the composition, due to the danger of the leather's being soiled and injured by the oil in the clay. For the long, narrow bands or parts of the design, small rolls of the modeling clay are rolled out between the fingers. Thus prepared, the roll is laid on a suitable portion of the design on the rough side of the leather.

part so that it sticks to the composition. Then the leather is turned over, thus bringing the smooth side up with the pattern imprinted upon it. The tooling is then begun.

In leather modeling, it is not desirable that the surface of the background should be crushed down with the tools. Therefore, every effort is made to keep the tool off of the background spaces as well as those of the design. The work of the tool is to follow the line almost with the edge (Fig. 3), forcing the line down against the board, thus stretching the wet leather down over the modeled design beneath. The tool is held very much as a pencil and is moved forward and to the right with a long, firm stroke.

Both sides of a band or other part of the design should not be tooled at one time, since the tool must always operate on the side of the design next the worker. Several lines running in the same general direction are tooled at one time, and then the leather is turned around on the board and the lines on the other side of the bands or other parts are tooled in the same way. After

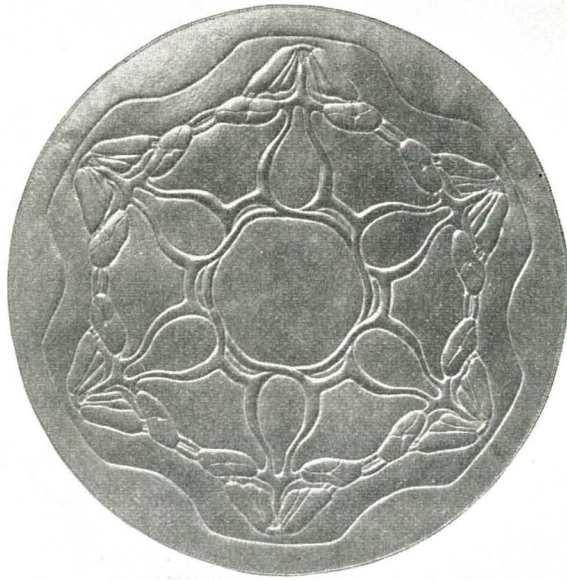


Fig. 5. Mounted Mat, Edges Turned and Sewed.

tooling that portion of the design under which the composition has been modeled, the leather is turned over and the composition removed. The lifting of the paper usually pulls a part of the clay loose from the leather. The remainder may be removed by rubbing a small piece of the composition over the modeled part.

Other parts of the design are then modeled in the composition and those parts tooled in the same manner as described. When all the pattern has been tooled, it is thoroly inspected to see if any part has been omitted, and to correct any defects which may appear. The surplus border is then cut off with a very sharp knife cutting directly down thru the leather upon the board. This leaves the edge a much lighter color than the surface of the leather. By the use of leather dye or India ink and a small brush, this edge may easily be darkened and, if desired, made to match the other color.

When the leather has thoroly dried, it is then given a polished surface. This is done by the use of a leather wax which may be procured from almost any dealer in art supplies. A very thin coat of wax is rubbed on the leather with a soft cloth and immediately followed with a moderately stiff bristle brush in order to work the wax uniformly into the pores of the leather. After fifteen or twenty minutes, the waxed surface is rubbed rapidly with a cloth, preferably a piece of silk. This gives a beautiful soft polish to the surface and finishes the piece of work, as shown in Fig. 4.

Mounting.

By the term mounting is meant the turning of the edge, pasting or sewing the linings and pockets in such pieces as magazine covers, bill books, card cases, cigar cases, etc., and putting fixtures, locks, handles, etc., on such pieces as handbags. The table mats may have the edges turned and linings or backs put on and padded, as shown at Fig. 5.

The method of making up a bill book is here described as a problem in mounting. The bill book when finished and opened flat measures $8\frac{1}{4}$ by $8\frac{1}{4}$ inches. Hence, for this problem, a piece of leather $9\frac{1}{4}$ by $9\frac{1}{4}$ inches is necessary. This amount allows for $\frac{1}{4}$ inch turn all around and for $\frac{1}{2}$ inch rough margin for trimming purposes as explained in the finishing of the mat. In addition to this piece, there should be a lining of thin leather $8\frac{1}{4}$ by $8\frac{1}{4}$ inches and a piece for the pocket, $4\frac{1}{4}$ by $8\frac{1}{4}$ inches.

By the use of a smooth, sharp instrument, the $8\frac{1}{4}$ inch square is marked on the leather, as indicated in Fig. 6. When the design has been drawn, it is transferred to the smooth side of the leather and in the position indicated at Fig. 6. It will also be noted in this figure that a monogram is suggested for the back of the bill book. The design is traced as heretofore indicated, on the rough side, modeled in the composition, and tooled exactly as detailed in connection with the

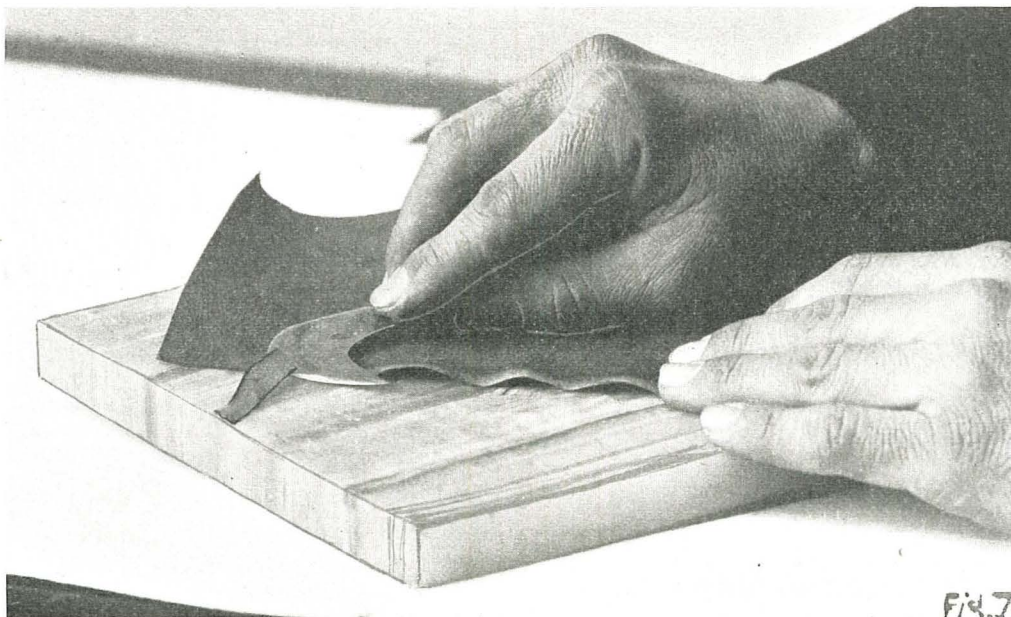


Fig. 7.

FIG. 7. SKIVING, OR TRIMMING EDGE OF LEATHER.

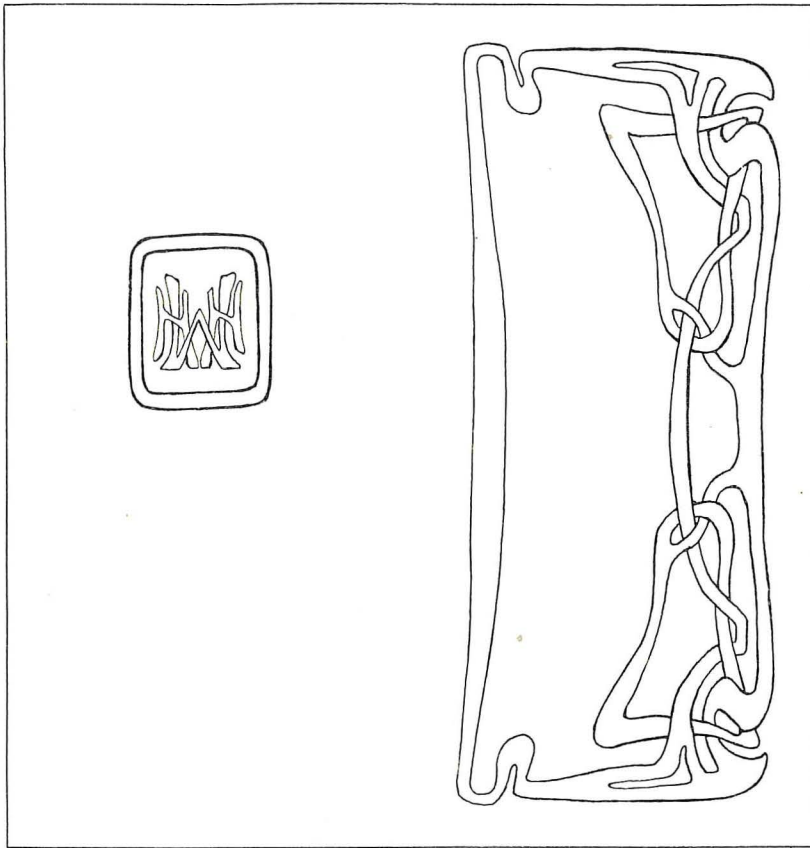


Fig. 6. Design for Bill Book.

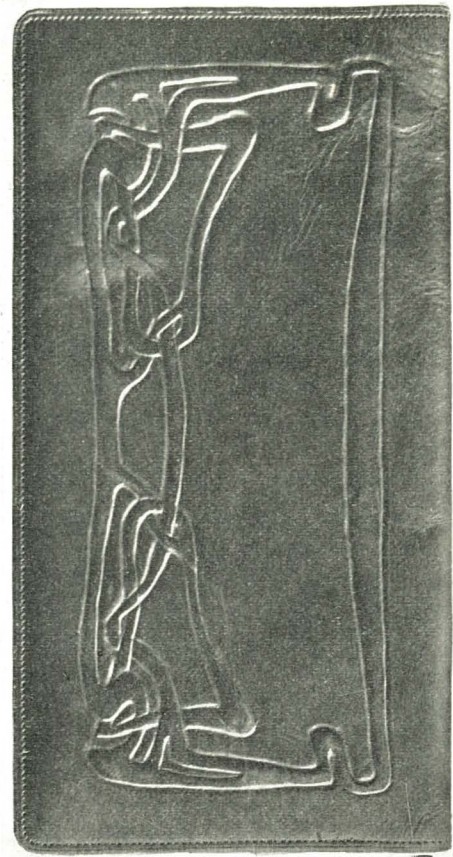


Fig. 9. Completed Bill Book. Edges Turned and Sewed.

mat. This done, the rough half-inch margin is cut off, leaving a $\frac{1}{4}$ inch margin to turn.

The edges which are to be turned over must be shaved or "skived" very thin, for about one-half inch inward, using a knife similar to the one shown in Figs. 2 and 7. This process is best done by laying the leather, smooth side down, on a piece of marble or other smooth stone. Satisfactory work can be done, however, on a piece of tin or smooth board. The positions of the knife

and the leather during the skiving process are shown in Fig. 7. It will require some practice, patience and care to get the edges uniformly thin without cutting back too far or thru the leather. However, scraps of leather may be utilized for practice, until sufficient skill has been acquired to do the work well. The edges of both the lining and the pocket pieces of thin leather are likewise to be shaved thin for about $\frac{1}{4}$ inch all around.

Flour paste is thoroly rubbed into this narrow edge

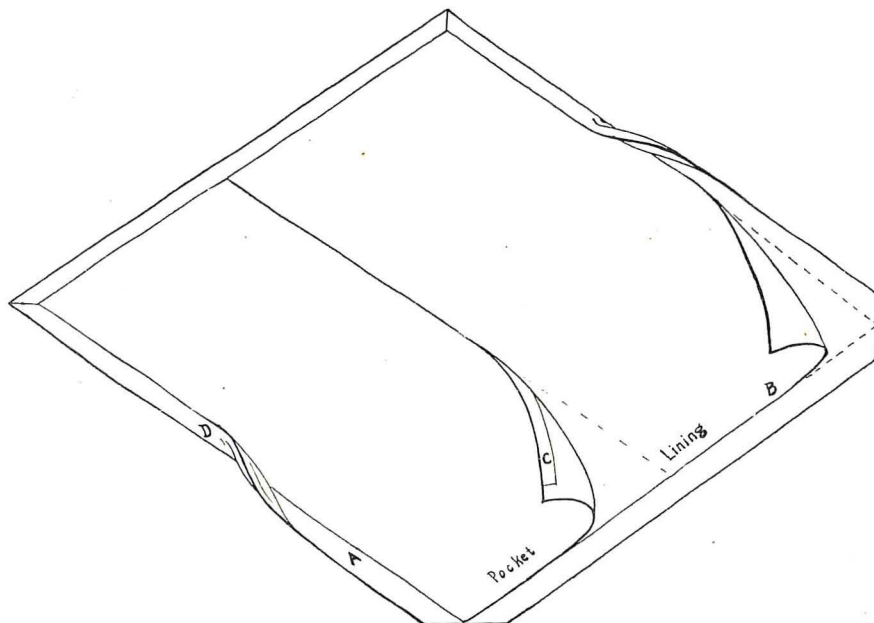


FIG. 8. BILL BOOK IN PROCESS OF MOUNTING.

which has been shaved thin around each piece of leather, always remembering that the paste is to be put on the rough side. One of the long edges of the pocket piece is folded over $\frac{1}{4}$ inch. This can best be done by scoring the leather heavily with the tool and a straight edge used on the rough side of the leather. This turned edge becomes the top edge of the pocket. Then the $8\frac{1}{4}$ by $8\frac{1}{4}$ inch piece of lining leather is placed in position on the tooled piece with rough sides together, as at B, Fig. 8. When the lining leather is in proper position, a uniform margin of $\frac{1}{4}$ inch of the tooled leather should project all around. Next, the pocket piece is laid, rough side down, on the lining so that the unturned long edge lies exactly on the edge of the lining, as shown at A, Fig. 8.

When the lining and the pocket have been properly adjusted, the edges are firmly pressed down. Then with a straight edge and the tool for a scoring instrument, a line is heavily scored on the tooled leather exactly at the edge of the lining. The four corners are cut as indicated in Fig. 8. When the edge has again been covered with paste, it is carefully turned over upon the edge of the lining and the pocket. The bill book is then covered with a piece of clean paper and a weight put upon it. A letter press or a binder's press is excellent

for this purpose. After it is thoroly dry, the process of waxing is gone thru as in the mat problem.

Fig. 9 shows a bill book completed in this way with the additional feature of sewn edges. The sewing may be done on an ordinary sewing machine, or by hand.

Fig. 10 shows a design used for a cigar case made in a somewhat similar way but with entirely different proportions.

The processes here described are sufficient for making purses, book covers, cigar cases, music rolls, magazine covers, etc. For the handbag, the tooling is the same as here described, but the mounting should be done by professionals who may be found in almost any large city. There are firms in most cities which will send to any enquirer, full size patterns giving sizes and shapes of the various pieces necessary to make bags, bill books, etc., with their prices for mounting such pieces after the tooling is done. M. S. Davis & Co., Washington St., Chicago, is such a firm.

This discussion has considered simply the modeling of leather already dyed. Of course, the possibilities are without limit for the work where the tooling is done on the natural leather and the dyeing is done afterward. Combinations of various colors when properly used, add greatly to the beauty, the value, and the pleasure of the work.

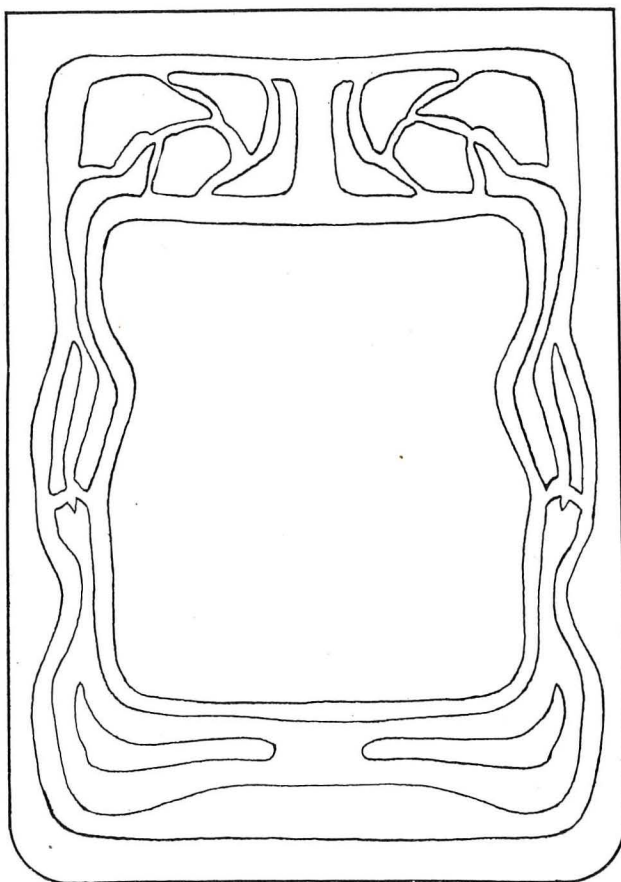


Fig. 10. Design for Cigar Case.



Flower Holder and Jardiniere. Made by pupils in public schools of Bristol, R. I.

SCHOOLROOM BASKETRY

Nellie M. Pairpoint, Director of Manual and Household Arts,
Bristol, R. I.



HE coiled basket is one of the most practical and satisfactory forms of manual training for the intermediate and lower grammar grades, and it can be made to supply all the educational principles of the most up-to-date manual training.

Two forms can be used, varying according to the kind of coil. A heavy jute twine about as thick as a number three reed, weighing about one pound, can be bought for fifteen cents a ball. This makes an excellent foundation, and when wound tightly with raffia is almost as hard and firm as a reed foundation; and it is easier to begin the basket, also very much less expensive.

It is best to have the children make a small mat, with twine foundation, to learn the stitches, and how to start a basket. Finish the edge of this mat with a fringe, drawn thru the last row with a crochet hook, and fasten in place with the buttonhole knot.

While making these mats they should learn how to begin the work, how to make at least two stitches, such as the Lazy Squaw and Lace stitch, and then they will

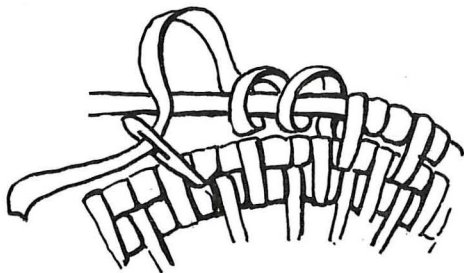
have enough practical knowledge to make a design and working drawing of the basket to be made. The best stitches for school use, are the Lazy Squaw, Figure Eight, Pomo, Lace and Buttonhole stitches.

The Lace stitch being open combines well with all the others. The Buttonhole stitch gives a rough surface, and can be used effectively for decorative bands with smooth work, like the pomo or Figure Eight stitches.

Each pupil should be given a choice of making a basket for one of two or three purposes, such as,—a candy basket,—a work basket,—or a basket to hold some small personal belongings. Stipulate that each basket is to have a circular form, sides of a depth to suit the purpose for which it is made, and a cover, so that the problems will be practically the same in each case.

When each pupil has selected the object for which his basket is to be made, he must decide upon the best size and shape for that purpose.

For some purposes a basket that is large, round and



Lazy Squaw.

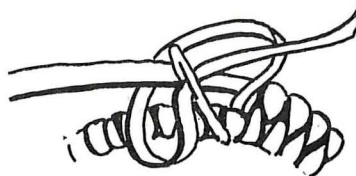
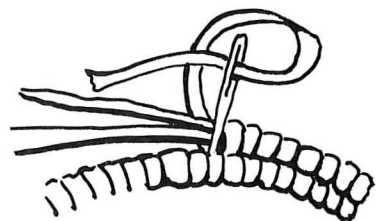
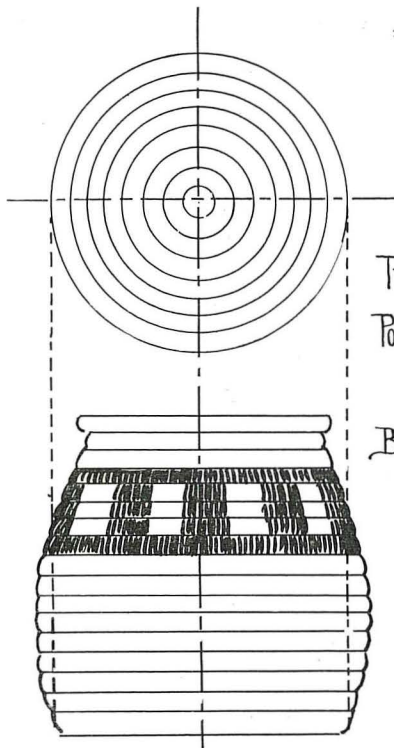


Figure Eight.



Pomo.

STITCHES FOR CLOSE WORK.



Working Drawing.

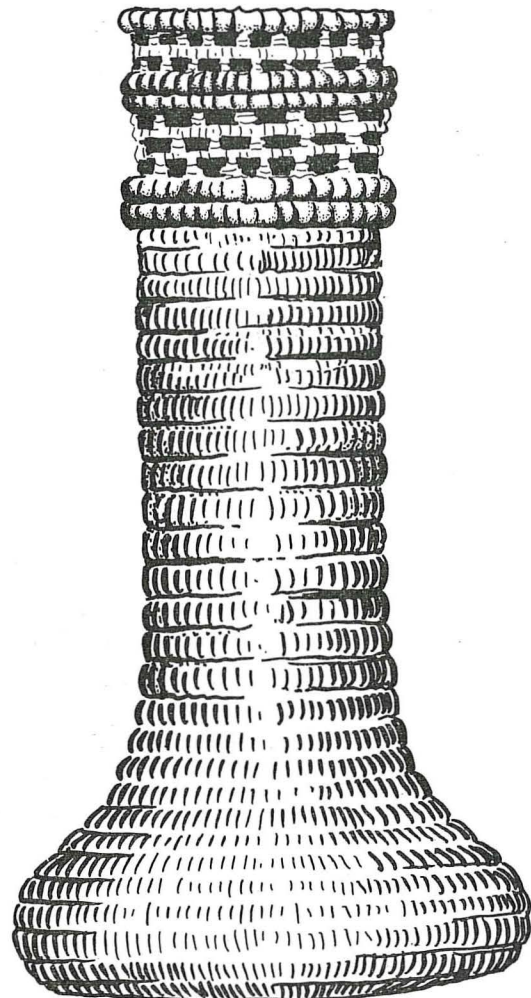
TRINKET BASKET
Pomo & Buttonhole
Stitches.
Brown and
Burnt Orange.

shallow, would be more convenient than a small, deep basket.

When these facts are decided, have each pupil draw and cut from paper the shape and size his basket is to be made. Trace these cut patterns on to drawing paper to show the size of the bottom, and the depth of the sides; and have each pupil work out the number of coils that will be needed for the bottom, and to make the required depth. Have these drawings made with compasses and rulers, and the results will be good working drawings.

The decoration to be used should be determined on this working drawing, marking the colored spaces, so that the exact number of rows needed in each part will be shown.

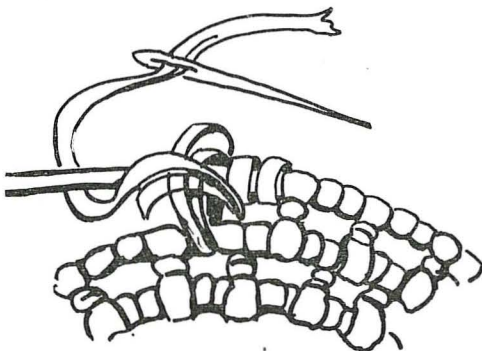
When this preparation is made, and the pupils have learned how to make the stitches, they are ready to intelligently make the basket they have designed.



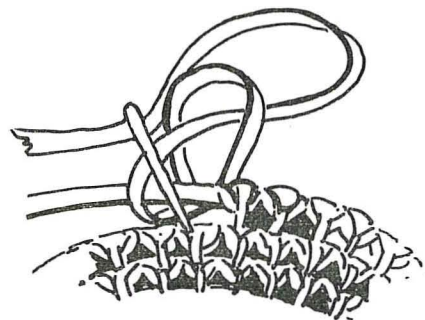
Design for Flower Holder.

If a reed foundation is to be used, shave one end of the reed to a point, letting the cut run back about two inches. Soak the reed for fifteen or twenty minutes in water, then wind with raphia right down to the point. Bend the point round to make a tight coil, and pass the needle thru the reed to hold it together firmly.

Start all coiled baskets with the Lazy Squaw stitch, made by winding round the foundation reed twice, and under the coil before; then after two or three coils are made, change to whatever stitch is to be used.



Lace Stitch



Buttonhole Stitch

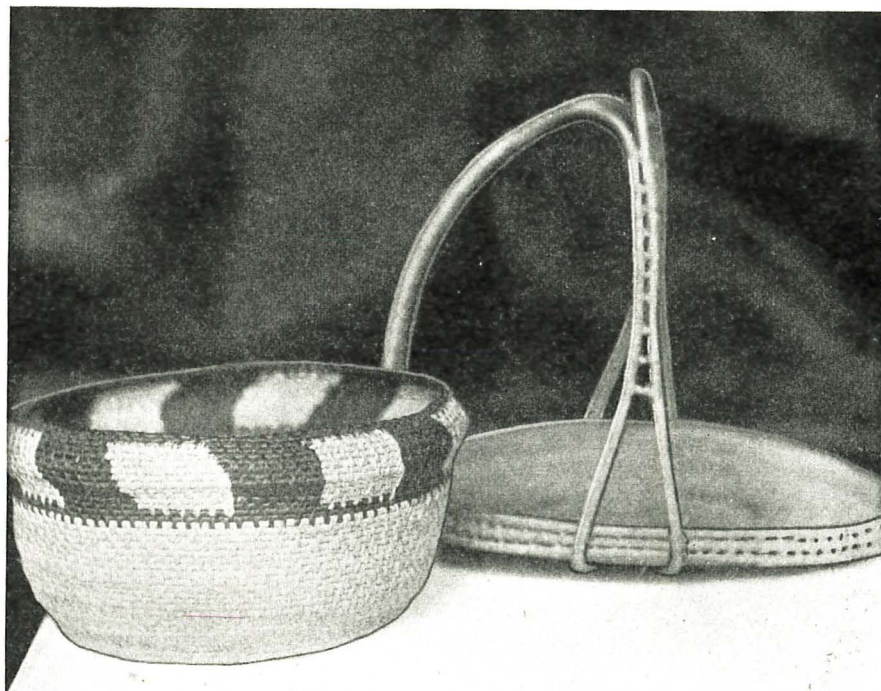
It will be found for practical manual work, that the extreme fineness of the baskets is no advantage. Using the raphia the natural width, prevents strain on the pupils' eyes, and also makes the work progress more rapidly, which is just as well in the limited time allowed in most schools.

The plain band of color is the simplest form of decoration. Vertical lines are the next easiest. Separate figures are the next development in decorative design for coiled baskets, and the weaving of the figures round the basket diagonally is the most difficult that had better be attempted in elementary schools.

It seems desirable to select colors for basketry, that are especially found in natural vegetable growths. Browns, greens, yellows, combined with small quantities of bright orange, and clear black, seem the most appropriate color schemes, while reds, blues, and purples, are best left out altogether, or used in very small spaces.

The good taste of the worker has a splendid opportunity to show in this branch of manual arts.

Coiled basketry is particularly desirable for use in the fourth, fifth, and sixth grades, and can be done in any schoolroom, with both boys and girls; or, where the classes can be divided, it may be used for the boys' classes while the girls are sewing.



WORK BASKET AND SANDWICH TRAY.
Made by pupils in public schools of Bristol, R. I.

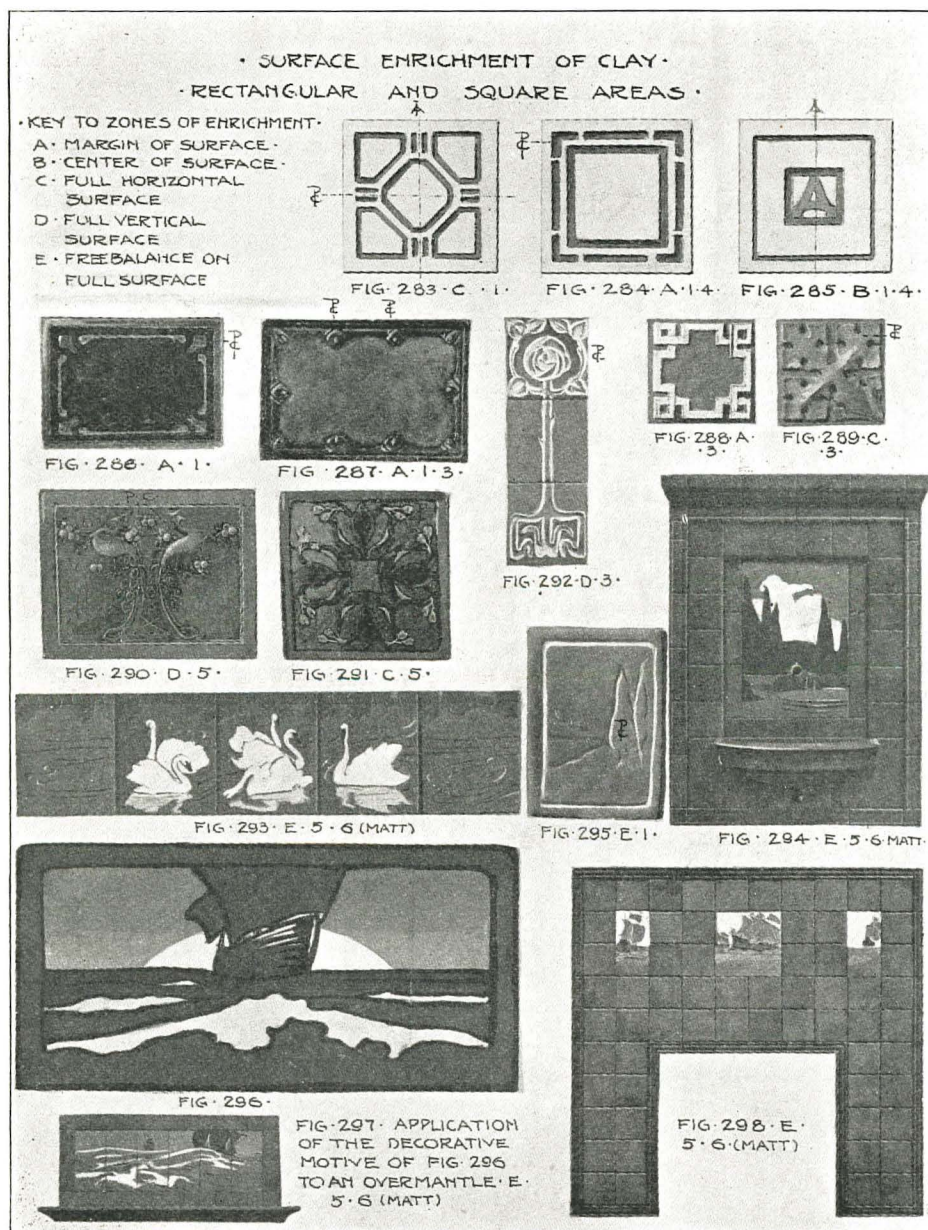


Plate 41.

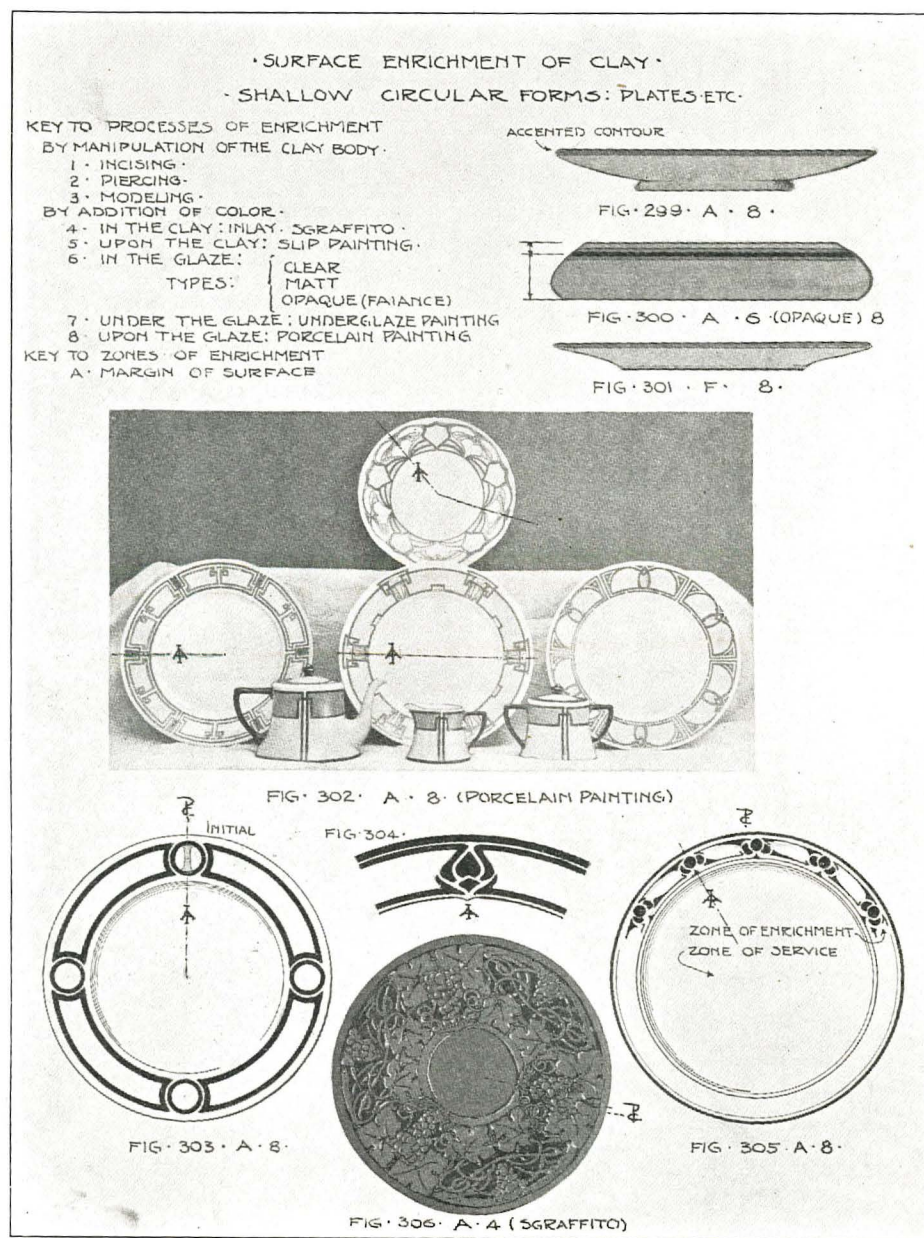


Plate 42.

INDUSTRIAL ARTS DESIGN

Wm. H. Varnum, University of Wisconsin

(Eleventh Article)

THE SURFACE ENRICHMENT OF CLAY.



IN many respects the surface enrichment of clay is similar to the surface enrichment of wood as, for example, the similar effect produced by inlays in clay and in wood.

On the other hand, while the enrichment of clay is unhampered by the restricting effects of the wood grain, it is limited to those effects or forms of enrichment that are capable of withstanding the intense heat to which ceramic decoration is subjected.

Decorative Processes of Surface Enrichment.

Before proceeding to actual designing, it is well for the reader to understand clearly the possibilities of clay enrichment; which designs are best suited to clay as a medium, to the intended service and to the ultimate application of the heat of the pottery kiln. Without entering into technicalities, let us briefly discuss the following processes. The first three deal with finger and tool manipulation of the clay body and are consequently the simpler of the processes. The last five are concerned chiefly with the addition of coloring pigments either to the clay or to the glaze and are, therefore, more complex in character.

1. *Incising.* This is the simplest form of enrichment, a process familiar to the earliest of primitive potters and equally applicable now to the lower grade of work. It consists of the process of depressing lines or planes into the clay body to the depth of from 1-16 to $\frac{1}{8}$ of an inch. These areas or lines should be bold and broad. They may be depressed with a blunt pencil or a flatpointed stick. A square, rectangular or round stick may be used as a stamp with which to form a border. Illustrations of simple incising may be found in Figures 283, 284, 295, 319, 330. The tiles are about six inches square.

2. *Piercing.* This process is less common and, as its name implies, is carried out by cutting thru the clay with a fine wire. Either the background or the design itself may be thus removed. The effect produced is suitable for lightening the top of such problems as a hanging flower holder, window flower box or lantern shade.

3. *Modeling.* By adding clay to the body of the ware and by working this clay into low relief flower or geometric forms, one has the basic process of modeling. The slightly raised areas of clay form a pleasing play of light and shade that varies the otherwise plain surface of the ware. The process should be used with caution, for overmodeling (Figure 325), will obstruct the structural outlines and because of its over prominence as decoration, it will cease to be *surface enrichment*. In the technical language of the designer, modeling is an enrichment which is not subordinated to the surface. In articles intended for service, this high relief modeling is unsanitary and unsatisfactory.

Figures 286 and 287 show incising with slight modeling, while 324, 328 and 329 are examples of fuller modeling.

Introduction of Coloring Pigments.

With the introduction of the second group comes the added interest and difficulty of the introduction to color. Pigments that will withstand the application of heat are suggested at different points.

4. *Inlay.* This process consists of removing certain areas from the clay body to the depth of $\frac{1}{8}$ inch and filling in the depression with tinted clay. Tints formed by the addition of ten per cent or less of burnt umber or yellow ochre will give interesting effects. Figures 284, 285, 320 and 321 show forms which may be developed by this process.

Sgraffito, an Italian process, is more difficult than inlaying but the effect is similar. A thin layer of colored clay is placed over the natural clay body while the design is developed by cutting away this colored coating in places, thus exposing the natural clay body (Figure 306). There are variations of this plan that may be attempted by the advanced designer.

5. *Slip Painting.* Slip is clay mixed with water to the consistency of cream. For slip painting, this is thoroly mixed with not more than ten per cent of coloring pigment as represented by the underglaze colors of the ceramist. This thick, creamy colored slip is then painted on the damp surface of the clay body while damp, much as the artist would apply oil colors. The ware, when thoroly dried, is glazed and fired, producing the effect shown in Figures 290, 291 and 324. The color range is large; almost any color may be used with the exception of reds and strong yellows. A colorless transparent glaze should be used over beginner's slip painting.

6. *Colored Glazes.* This process refers to the direct introduction of the colored pigment into the glaze. By varying the glaze formula we may have a clear, transparent, or glossy glaze similar to Figure 317; a dull surfaced opaque effect, termed a matt glaze, Figure 332, or a glossy but opaque faience glaze similar to the blue and white Dutch tiles. There are other forms such as the crystalline and "reduced" glazes but these as a rule are far beyond the ability of the beginning craftsman in ceramics.

It is possible to use these three types of glazed surface in various ways. For example, a vase form with an interesting contour may be left without further surface enrichment except that supplied by a colored matt *similar to certain types of Teco Ware* or a clear glaze. It is likewise possible to apply transparent glazes over incised designs, inlay or slip painting, increasing their beauty and the serviceability of the ware. A semi-transparent glaze is sometimes placed over slip painting giving the charm inherent to the Vellum Ware of the Rookwood Potteries, Figure 332. Greens, blues, yel-

lows and browns with their admixtures, are the safest combinations for the craftsman who desires to mix his own glazes.

7. *Underglaze Painting.* This process may be seen in the examples of Newcomb Pottery illustrated particularly in Figure 314 or 326. The underglaze pigment is thinly painted upon the fired "biscuit" or unglazed ware. A thin, transparent glaze is then placed over the color and in the final firing the underneath color shows thru this transparent coating, thus illustrating the origin of the name underglaze or under-the-glaze painting. Sage green and cobalt blue underglaze colors are frequently used in Newcomb designs with harmonious results. The outline of the design is often incised and the underglaze color, settling into these channels helps to accentuate the contour. (See Figure 314.)

8. *Porcelain or Overglaze Painting.* This is popularly known as china painting and consists of painting directly upon the glazed surface of the ware and placing it in a china kiln where a temperature between 600 degrees and 900 degrees C. is developed. At this point, the coloring pigment melts or is fused into the porcelain glaze, thus insuring its reasonable permanence.

The eight processes briefly described, may be readily identified on the plates by referring to the numbers corresponding to those which number the processes and are added to each figure number. Two processes are sometimes suggested as possible for one problem.

Classification of Structural Forms.

Different clay forms require different modes of treatment; to simplify and group these treatments will now be our problem. It has been found convenient to form four divisions based upon the general geometric shape of the ware. The first (Plate 41), includes rectangular and square areas; the second (Plate 42), shallow and circular forms; the third (Plate 43), low cylindrical forms and the fourth (Plate 44), high cylindrical forms. The first three divisions have distinct modes of design treatment while the fourth interlocks to a considerable extent with the third method. We will now consider each plate with reference to its use and possible forms of enrichment. For the sake of brevity, the results have been condensed into tabulated forms.

Square and Rectangular Arcas. (Plate 41.)

Problems: Tiles for tea and coffee pots, paper weights, window boxes, architectural tiles for floors and fire-places.

Zone of Enrichment: (A) In the margin.

Reason for Choice: Central area to be devoted to zone of service or for simplicity of effect.

Type of Design: Bands or Borders.

Inceptive Axis: For corners; the bisector of the angle.

Points of Concentration: The corners and if desired, at equal intervals between the corners.

Illustrations: Figures 283-284-286-287-288.

Zone of Enrichment: (B) Center of Surface, Free Ornament.

Type of Design: Initials, monograms, street numbers, geometric patterns and other examples for free ornament. A star or diamond is *not* appropriate

enrichment for a square area unless properly related to the contour by connecting areas.

Inceptive Axes: Vertical or horizontal diameters or diagonals.

Points of Concentration: Center of Embellishment.

Illustrations: Figure 285.

Zone of Enrichment: (C) Full Surface Enrichment in a Horizontal Position.

Type of Design: A symmetrical pattern generally radiating from the geometric center of the surface and covering at least two-thirds of the surface.

Inceptive Axis: Diameters or Diagonals of the area.

Points of Concentration: At the corners or the center of the outer margin at geometric center, as in a rosette.

Illustrations: Figures 283, 289 and 291.

Zone of Enrichment: (D) Full Surface Enrichment in a Vertical Position.

Type of Design: A symmetrical pattern with a strong upward movement and covering more than one-half of the surface.

Inceptive Axis: The vertical center line.

Point of Concentration: Upper section of the surface.

Illustrations: Figures 290 and 292.

Zone of Enrichment: (E) Free Balance over Full Surface.

Type of Design: Semi-decorative natural motive preferably covering the entire surface.

Inceptive Axis: Masses freely balanced over the geometric center of the area.

Point of Concentration: Near, but not in the exact Center.

Illustrations: Figures 293-294-295-296-297-298.

Note: The points of concentration should be accented by slight contrast of value and hue.

Shallow, Circular Forms. (Plate 42.)

Problems: Plates, saucers, ash trays, card receivers, almond and candy bowls.

Zone of Enrichment: (A) Margin of Interior Surface.
(A) Margin of Exterior Surface.

Type of Design: Bands or Borders thoroly related to the structural contours. Bands for exterior enrichment may be placed directly on the contour, Figures 299 and 301, thus forming an accented contour, or slightly removed from it, as in Figure 300.

Inceptive Axes: For interior surfaces, the radii of the contour circle generally supply the axis of symmetry.

Points of Concentration: For interior surfaces, the points of concentration may be placed in or near the radii of the area.

Illustrations: Figures 302-3-4-5-6.

Low Cylindrical Forms. (Plate 43.)

Problems: Cups, pitchers, steins, nut and rose bowls, low vase forms.

Zone of Enrichment: (A) Upper margin of Exterior.

Type of Design: Borders of units joining each other or connected by bands or spots acting as connecting links.

Inceptive Axis: Vertical elements of the exterior surface. Elements are imaginary lines dividing the

exterior surface into any given number of vertical sections. Elements used as center lines form the axis of symmetry about which the butterfly of Figure 308 and similar designs are constructed.

Points of Concentration: On each vertical element.

Illustrations: Figures 308-9-10-11-12-16.

Zone of Enrichment: (D) Full Vertical Surface.

Type of Design: Expanded borders with strongly developed vertical lines or forms. Less than one-half of the surface may be covered.

Inceptive Axes: Vertical elements.

Points of Concentration: In upper portion of vertical elements, hence in upper portion of area.

Illustrations: Figures 314-317-318.

Zone of Enrichment: (F) Free Balance of Full Surface. (See D, above.)

Illustration: Figure 315.

High Cylindrical Forms. (Plate 44.)

Problems: Vases, jars, pitchers, tall flower holders, covered jars for tea, crackers or tobacco.

Zone of Enrichment: (A) Margin of Exterior.

Type of Design: Borders of geometric units, freely balanced floral units and other natural motives placed in upper margin of mass.

Inceptive Axis: Vertical elements of cylinder.

Points of Concentration: In upper portion of vertical elements.

Illustrations: Figures 319-320-321-327-331-332.

Zone of Enrichment: (D) Full Surface of Exterior.

Type of Design: Free or formal conventionalized unit repeated on each vertical element. The units may be juxtaposed or may be connected by bands or similar links.

Inceptive Axes: Vertical elements of cylinder.

Point of Concentration: In upper portion of vertical elements.

Illustrations. Figures 322-323-324-326-328-329.

Rule 9A. Surface enrichment of clay must be so designed as to be able to withstand the action of heat to which all ware must be submitted.

Rule 9B. Incised, pierced and modeled decoration in clay should be simple and bold and thus adapted to the character of the material.

Rule 9C. A border should not be located at the point of greatest curvature in the contour of a cylindrical form. The contour curve is of sufficient interest in itself.

The reader should carefully consider the postulate and various divisions of Rule 7 and try to apply them to the material now under consideration. Acknowledgment is made for material supplied by the Rookwood Potteries for Figures 288-289-292-293-294-297-298-315-327 to 332; Newcomb Potteries, Figures 314-316-317-318-326; Teco Potteries, 329; Ceramic Studio Publishing Company, 302-307-308-310-312.

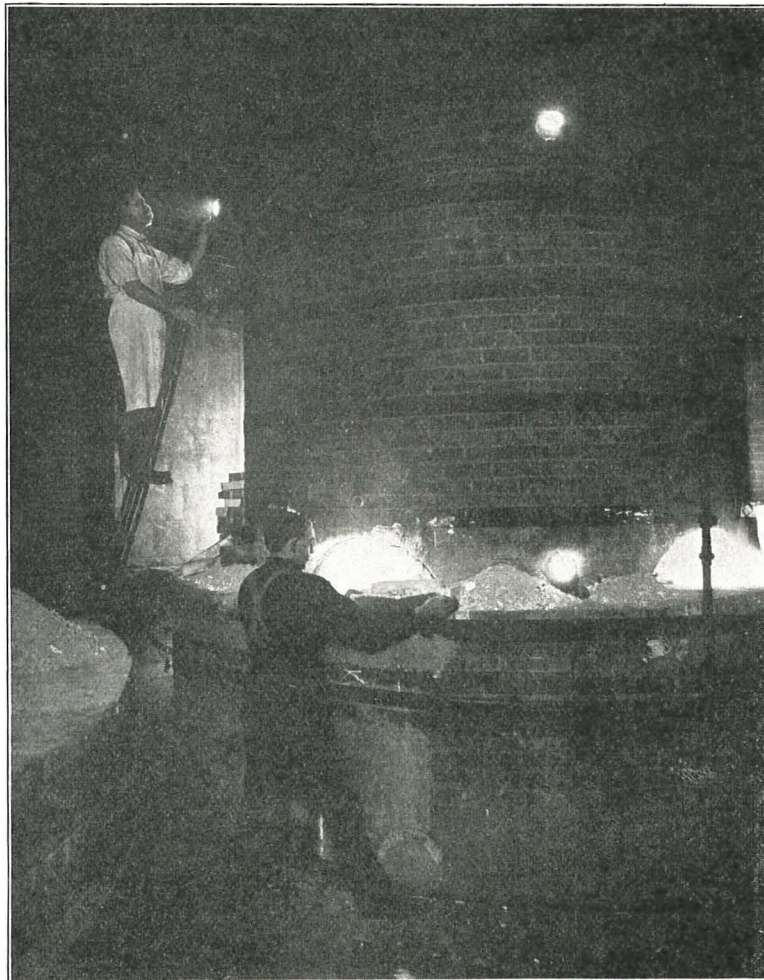


FIG. 333. FIRING THE KILN.
Courtesy of the Rookwood Potteries.

ESSENTIALS OF DESIGN IN TYPOGRAPHY

Fred Victor Cann, Dunwoody Institute, Minneapolis, Minn.

(Fifth Article)

Geometric Units of Design.



Since geometry is the basis of the construction of any design, it is well to begin with simple geometric forms, dividing each shape into as many parts as is necessary to lay out the whole design; next drawing in the guiding lines, as in 1, Fig. 11, building up the figure on this framework. The centers and corners will need special attention.

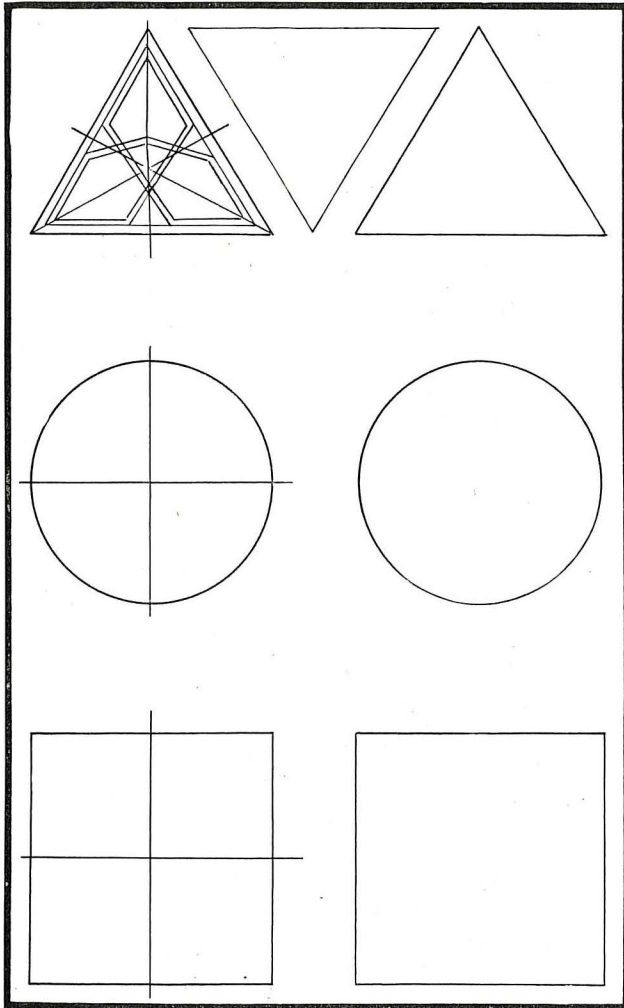


Plate 11.

In plates 11, 12 and 13 are suggested a few of the various schemes for laying out simple geometric units.

The following are suggested problems based on these schemes:

1. Make a design in the inverted triangle similar to No. 1.

2. Carry out design 2 in reverse values of black and white; if 2 has a white background make 3 with a black background and a white design, or vice versa.

3. Make a unit design with center and radiating spots appropriate to the given shape.

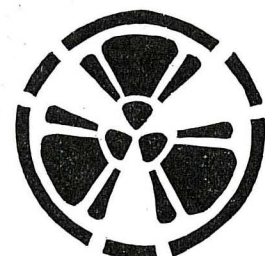
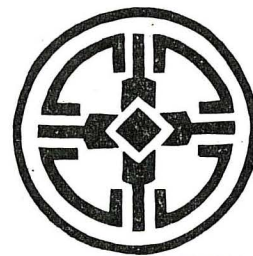
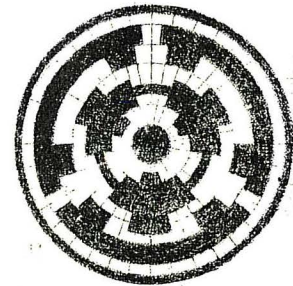
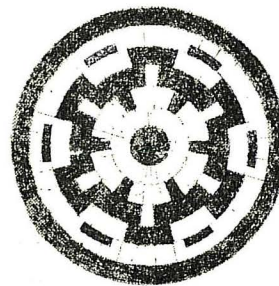
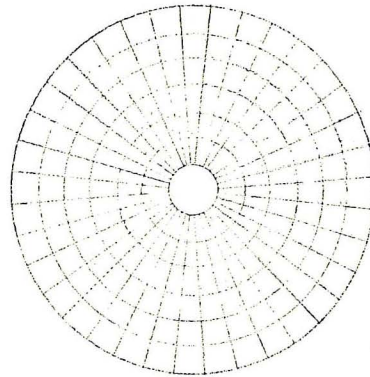
4. Make a unit design, with center and related parts, appropriate for a square.

Conventionalizing.

By conventionalizing is meant the adapting of some natural motif, like a plant or animal form, to any given shape or space.

The simplest way to reduce a plant form to a design is shown in plates 15, 16 and 17.

Follow this out carefully and note the different stages of development in the evolution from the plant form to the finished design.



—Ipswich Summer School of Art.

—Ipswich Summer School of Art.

Plate 12.

A design, to be really good, should be attractive; and to be attractive it should have some related elements, a definite style.

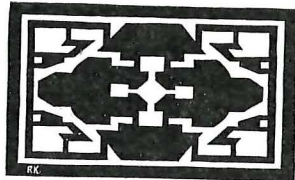
The way the different parts fit together in a large measure determines the character of a design. It is absolutely necessary that the parts of any design be related one to another, and that they either radiate from a center or root, or hold together as a unit.

Repeating.

To save time and work the artist often makes part of a design or drawing, to suggest how the finished product will appear. If the design is to be a surface design



—Emma J. Barrett.



—Teachers' College, Columbia University.

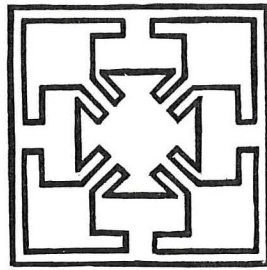
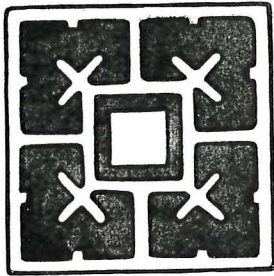


Plate 13.

to cover a large area, the artist is compelled to resort to geometry for help and lays out what he calls a skeleton layout, finishing perhaps a single unit, expecting (if the design is accepted), to trace and repeat over the whole surface. (See plate 17.)

As printers, it is well for us to know how the artist lays out his work, the better to co-operate with him and to be able to make rough sketches, diagrams and layouts ourselves when necessary, to show the customer or workman exactly what is wanted.

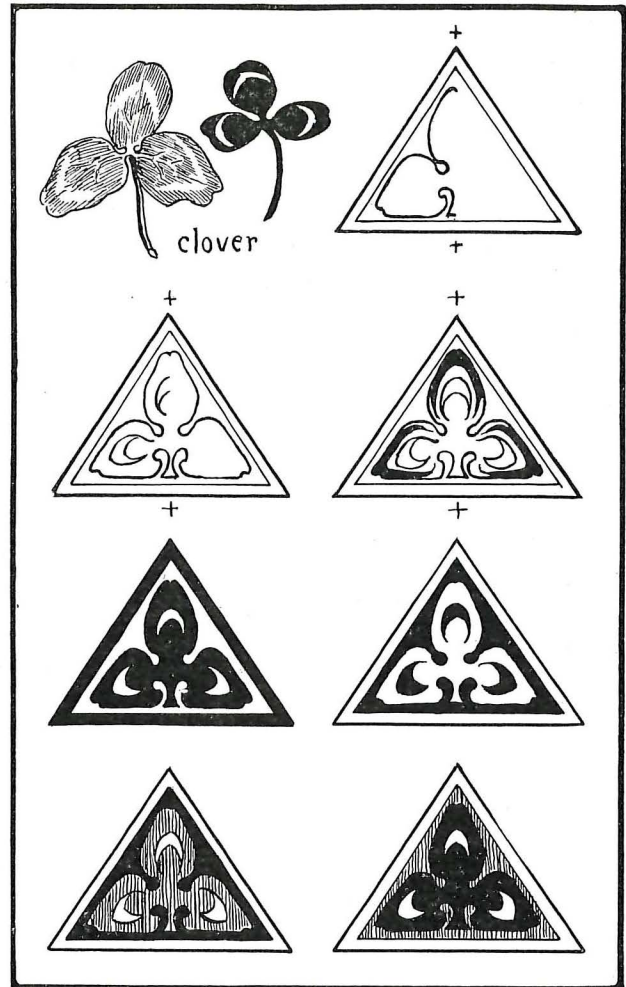


Plate 14.

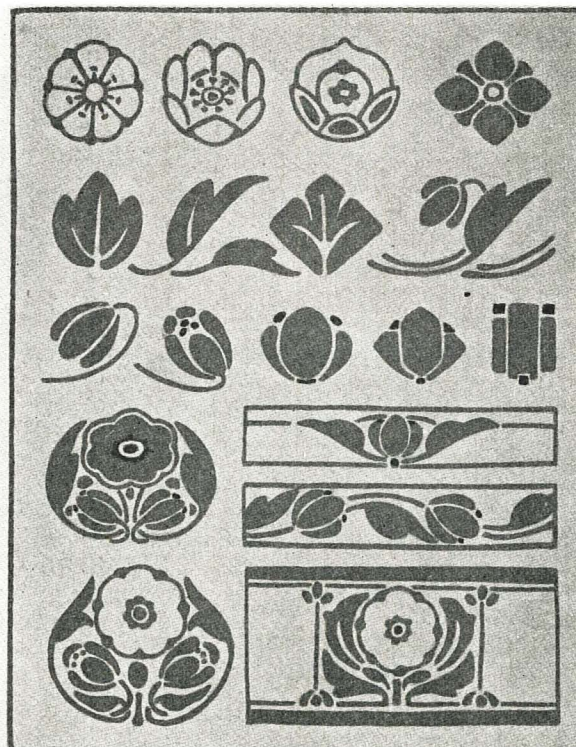
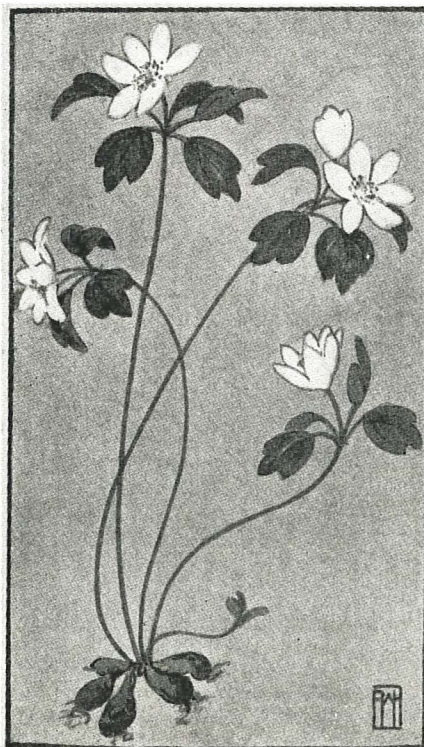


Plate 15.



Plate 16.

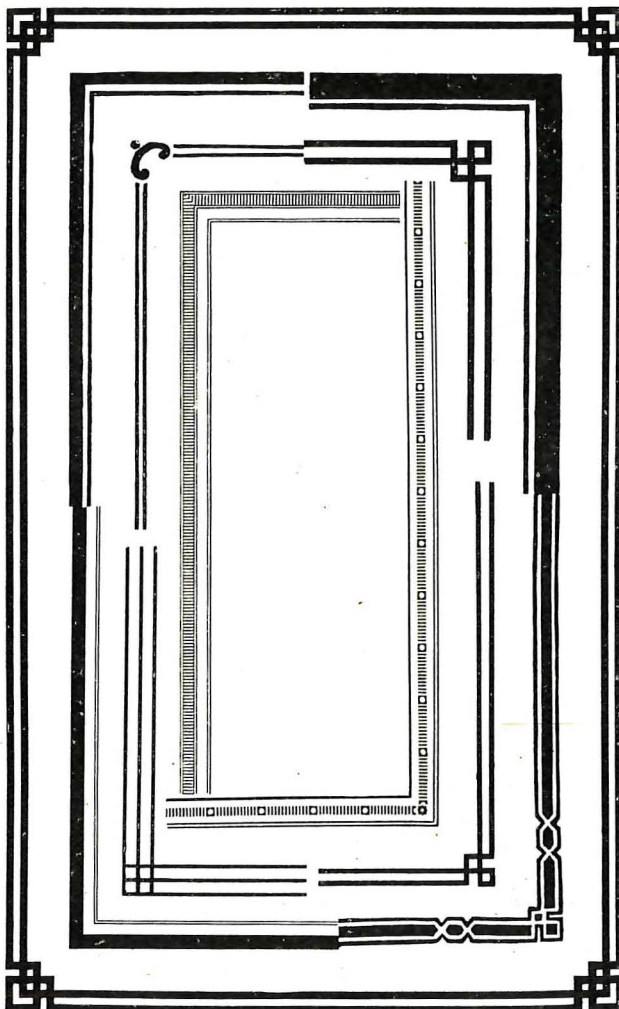


Plate 17.

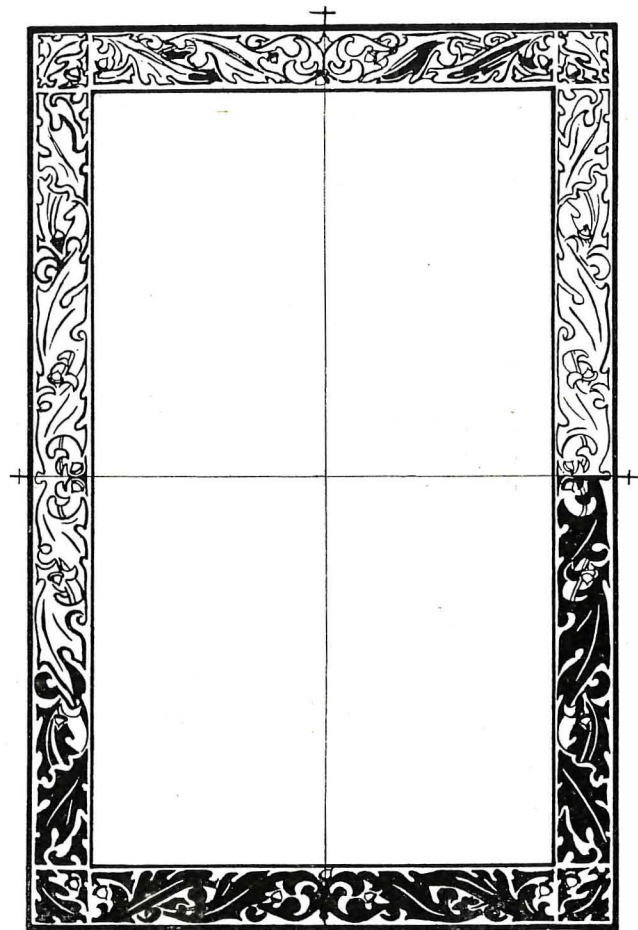
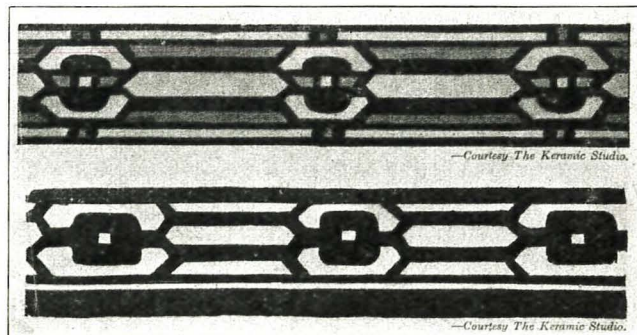
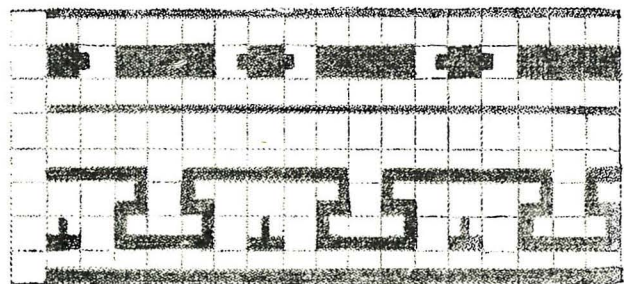


Plate 18.

Borders.

Borders form rather an important phase of decorative design and demand careful study.

The method of laying out a border is practically the same as for a surface design. First divide the space and make the guide lines, then build up the figure on these lines.



—Courtesy The Keramic Studio.

—Courtesy The Keramic Studio.

Plate 19.

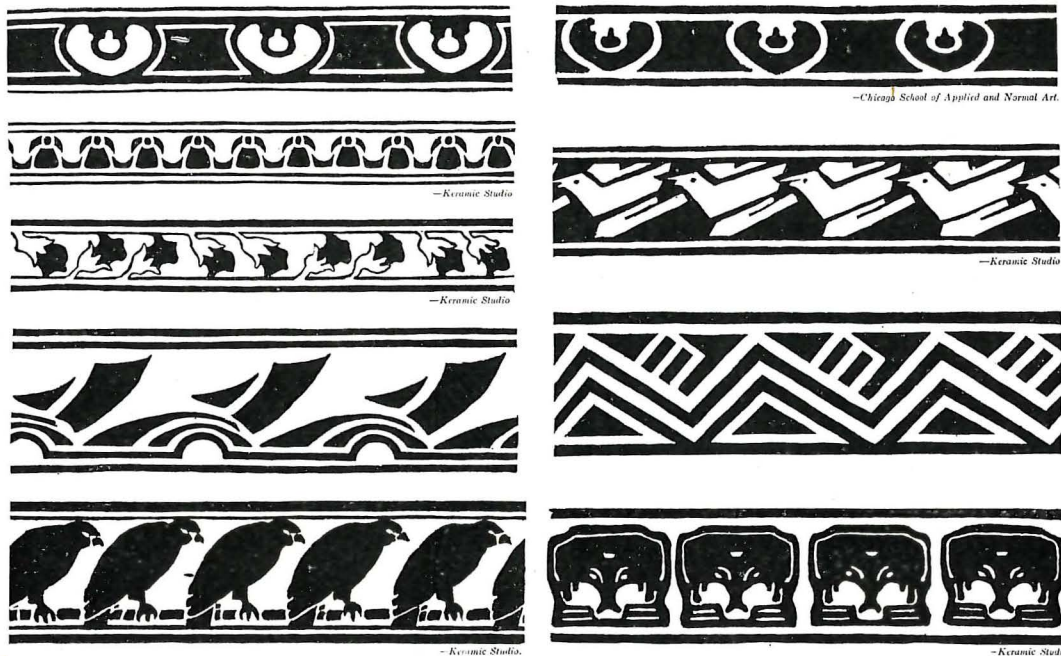


Plate 20.

The corners will need especial attention and should be in keeping with the rest of the border in style and character; study borders in magazines, books, and pick out the best and worst; decide why they are good or bad, appropriate or inappropriate.

Borders, like all other problems in design, are individual problems, each requiring its special treatment. The purpose for which we intend to use the border, whether for a page, poster, card, calendar; the face of type, letter, kind of picture; whether the job is to be printed in black and white or color, embossed or depressed,—are all elements that enter into our problem and determine to a large degree the character and style of the design.

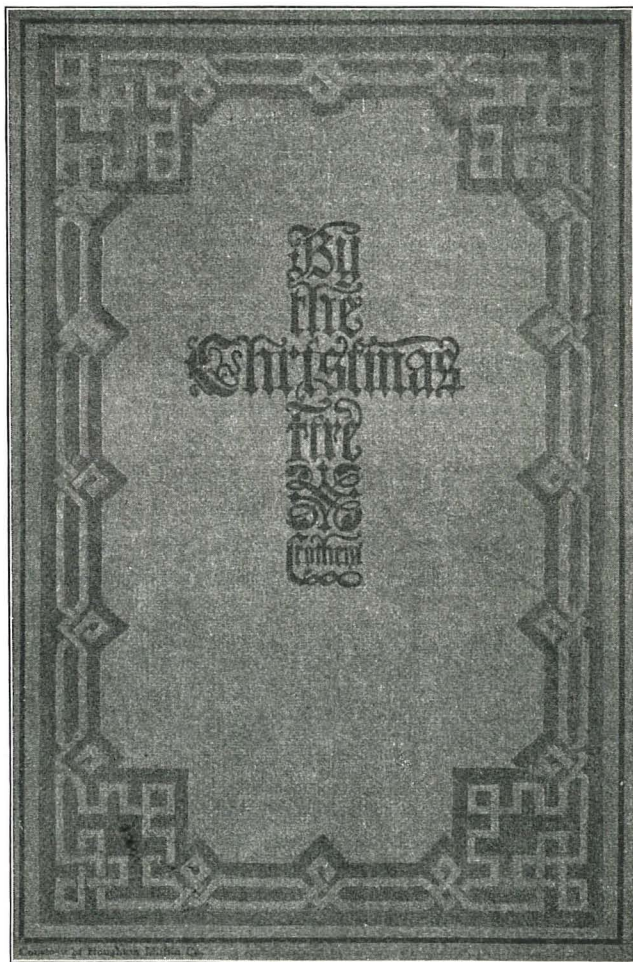


Plate 21a.



Plate 21b.

Let us study page borders to see why they are used. We see them in nearly every magazine, newspaper or circular printed. Why the border? Can we get along without it? Primarily it is intended as a decoration, a finish, whether on a page of type, wall paper or picture. Often it saves wear and tear on a plate by preventing the type from breaking down, thus lengthening the life of the plate. Its chief excuse for existence, however, is for decoration.

Borders are of many kinds and may be classified into three great classes as follows: The Geometric or Abstract Border; the Floral Border; the Animal Border. Under these headings come most of the different kinds we may make.

Borders may be made in many different ways. A page border is usually sketched in part and finished by repeating with tracing paper, in case the design is either bilateral or quadrilateral. When making a continuous design the whole border is sketched in without repeating. It is advisable for the student to begin with either a bilateral or quadrilateral repeat, as the continuous design is too difficult for the beginner. (Study plates 17, 18, and 19.)

Plates 3* and 18 are floral page borders and are good examples of the method of handling bilateral and quadrilateral borders with corners to match.

Ornaments.

The printer must exercise discretion in the use of ornament with type. It is so easy to go to extremes in ornamentation. A page may be so elaborately decorated

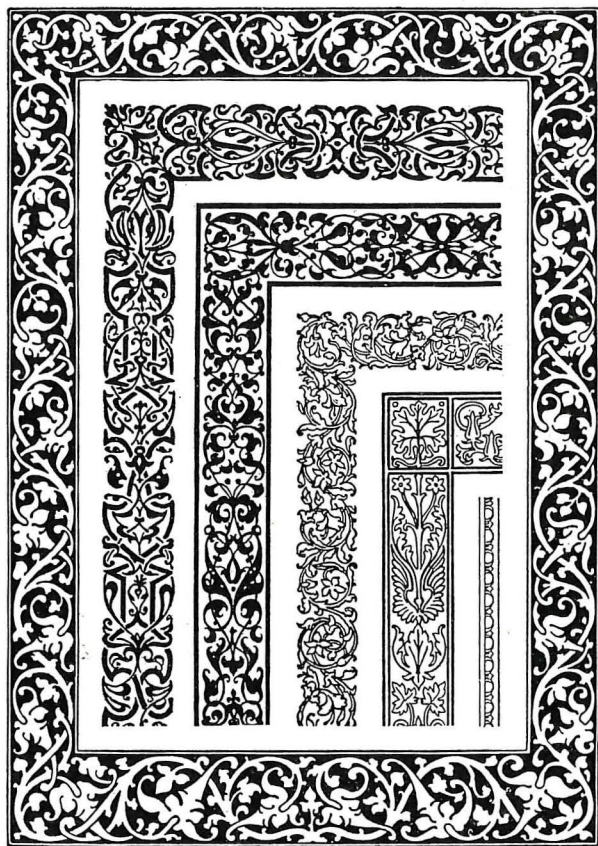


Plate 22.

*Note—Plate 3, Oct., 1915, issue.

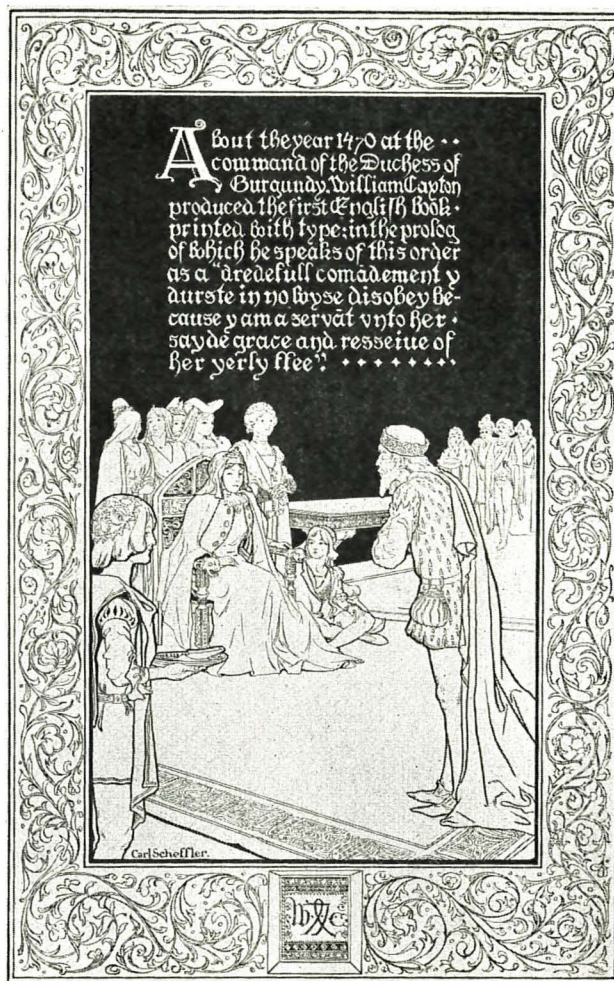


Plate 23.

THE INVENTION OF PRINTING.

Third of a series of calendar designs illustrative of the progress of the printing art. Designed and drawn by Carl Scheffler, Palette and Chisel Club, Chicago.

that the type matter, the important thing, is subordinated and the last thing one will see. This is poor design and shows not only lack of good taste, but poor judgment. Ornament must accent the text and make it more effective, or it does not serve its purpose. An initial and border may be made very attractive and may add greatly to the character of a page if both are kept in style and are appropriate to the text. Good examples of ornamentation are shown in plates 25, 26, 27 and 29.

The printer often buys stock ornaments from the type foundries and tucks them in with type indiscriminately without any regard for the style of the type or sense of the copy. One sees an elaborate ornament in company with plain Gothic letters. Both the elaborate ornament and the fancy letter are no longer popular. Our taste has improved with the advent of trained art into the commercial field. There is still room for improvement in American printing, especially along the line of ornamentation. A few good examples are shown from recent work of American, English and German printers. (See plates number 23 and 24.)

The problem of designing an ornament is much the same as the making of a border. It is a problem in the

SPokane
PUBLIC

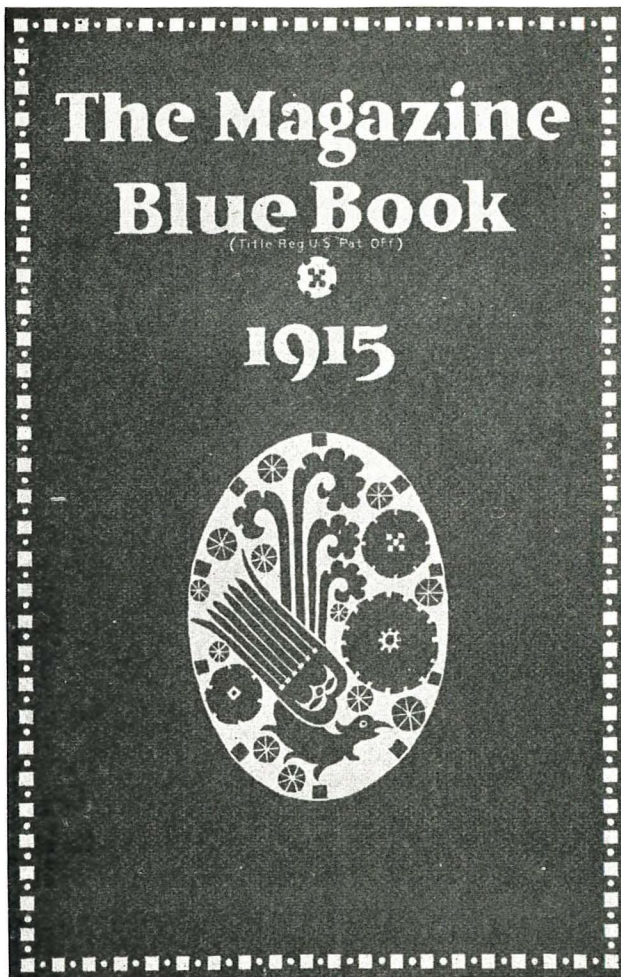


Plate 24.

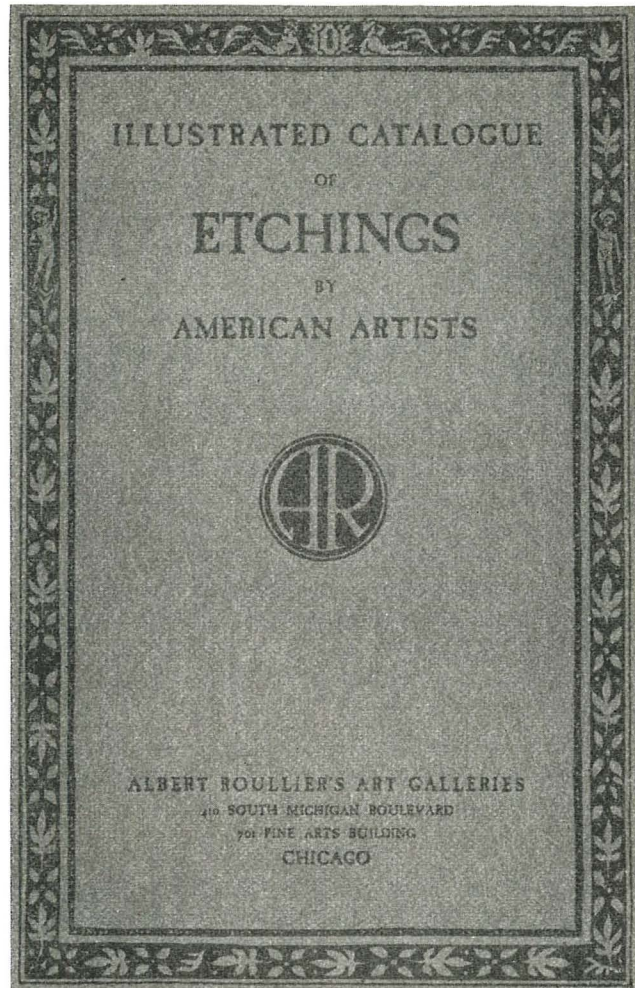


Plate 25.

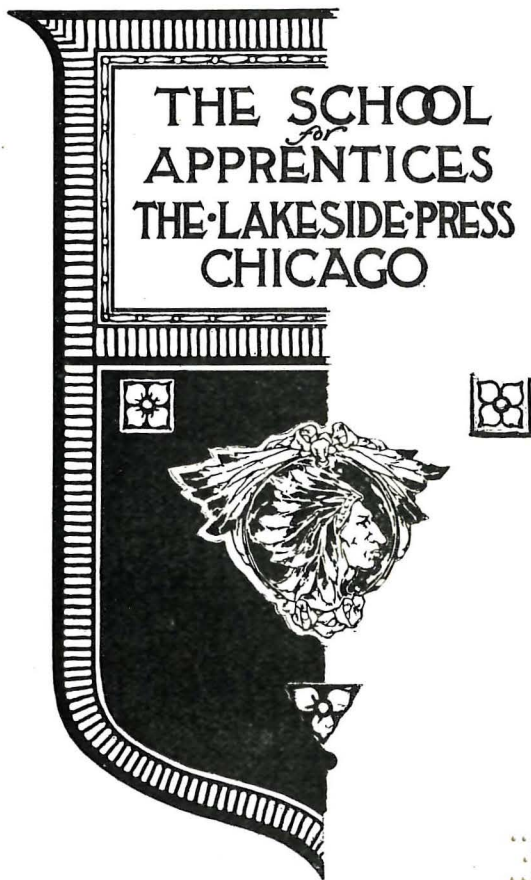


Plate 26.

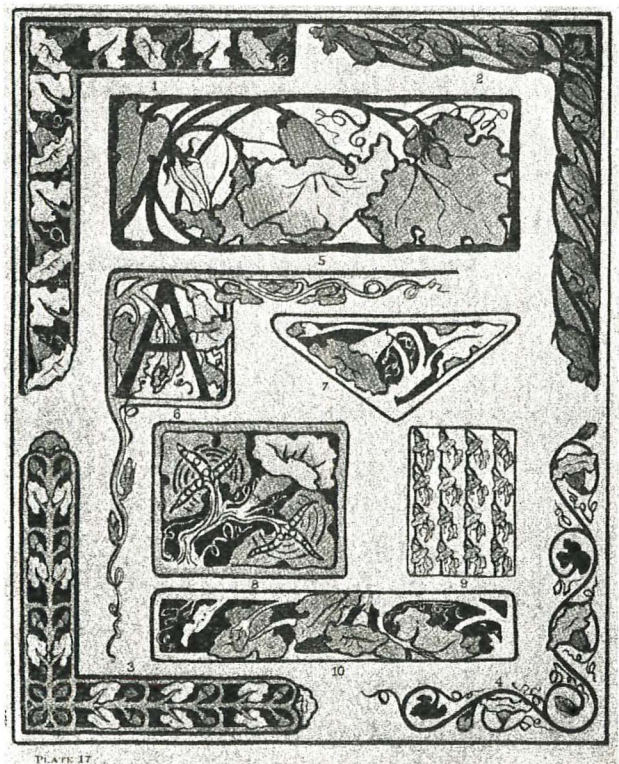


PLATE 17

Plate 27.

AN EDUCATION WITHOUT COST

AN EXPLANATION OF THE PLAN BY
WHICH YOUNG MEN AND WOMEN
MAY OBTAIN IT



THE CURTIS PUBLISHING COMPANY
INDEPENDENCE SQUARE
PHILADELPHIA

Plate 28.

division of space into a well thought out pattern of related spots, lines or units.

It is often necessary to design ornament for special work. The method of laying out an ornament is similar to that shown for borders. The designer first pencils out a sketch, finishing perhaps one part to show the color and general character of the design.

The designer usually decides on the size and shape of the ornament first, and then proceeds to make a few rough sketches until he hits upon an idea that suits him. The working drawing, or original, is made larger than is needed to allow for reduction on the camera. A few sketches are furnished to illustrate the method of laying out a design for reproduction. Often only a part of a

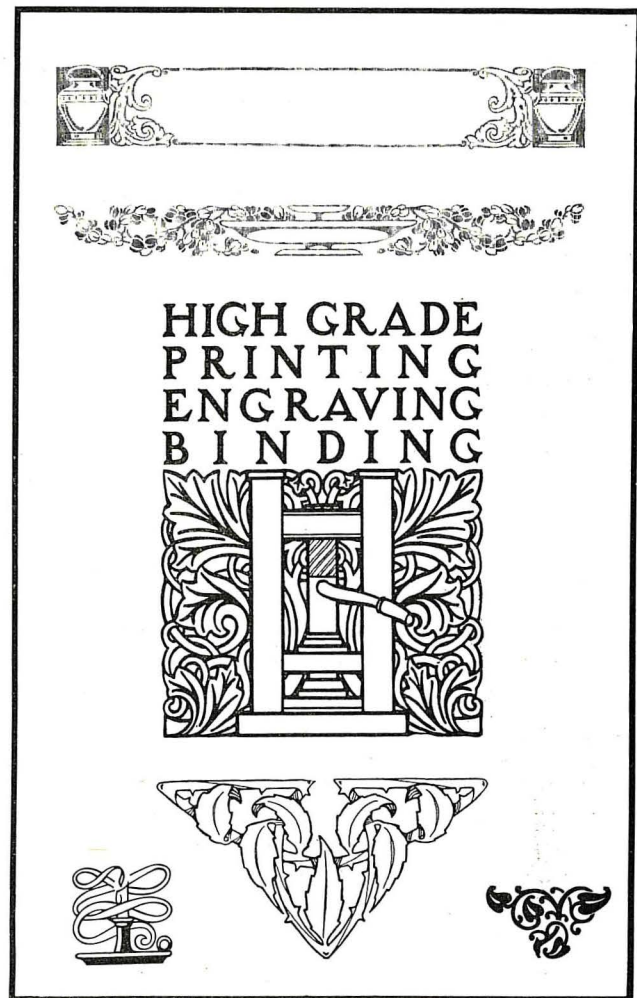


Plate 29.

drawing is finished, as the repeating can be done much quicker and cheaper during the process of reproduction. When the sketch is O.K.'d he then finishes the whole design for reproduction. This method is shown in plate 26.

The student is urged to study this method carefully as it illustrates the method followed by the artist in working up a drawing for reproduction.

Plate 26 illustrates the method followed by artists when laying out a bilateral unit to repeat. Only half of the design is drawn; the other half is made by tracing the first half and repeating by turning the tracing and redrawing on back of tracing paper, making a light transfer on to original, or it may be done by photography. The student will need to do this a number of times before becoming proficient. The object of this tracing is to save work, and to make the drawing as nearly symmetrical as possible.

THE EVOLUTION OF SHELTER

Leon Loyal Winslow



THE subject of housing is one in which children are practically interested. It is instinctive for little children to want to play house and it is but a short step from this activity to a real educative consideration of the housing problem. The work may be introduced by simple direction and suggestion. Stories will undoubtedly be employed as the work progresses and a visit to a neighboring point of interest, or to a museum, may later be arranged.

In different grades of the elementary school the housing problem will be handled differently, depending upon the ages and the development of the children. The possibilities of this problem of housing have recently been investigated and considered by a normal class in Industrial Arts in the School of Education at the University of Pittsburgh. Perhaps the best way to discuss the work as carried on by these students is to record a few of the facts relative to each of the stages of house development illustrated in Figures 1 and 2, which show a series of models made by individual members of the class.

A study of the manner in which the human race has provided itself with shelter from the elements and from hostile attacks of the enemy or of wild beasts will necessarily begin with the natural cave, A, or unmodified natural shelter. These abodes were not at all like what we might call a home today. They were merely places of refuge among the rocks, frequented by primitive man as he wandered about in an endless search for food.

It would often happen that a tribe would enter a territory where game was plentiful enough to attract it to remain in the immediate vicinity for some time. Natural caves in a case of this kind might be entirely inadequate because of their size or insufficient number. It came about that alterations were gradually made in natural caves, where a certain amount of breaking, scraping, and chiseling with tools made from a harder stone became necessary. A natural cave somewhat modified is shown in B. If no natural caves were available man made them by digging holes in the earth and covering them over with the limbs of fallen trees.

A further modification of the altering of natural caves or hollows in the rocks is shown in D, where several individuals formed a community and established dwelling places by cutting away the rock and building crude balconies to serve as platforms for those who had arranged their cave dwellings above. This arrangement undoubtedly suggested and later led up to the idea of the great communal cliff dwelling or Pueblo, E.

A great inventor was he who first conceived the idea that a wall could be formed by piling one stone upon another. It is likely that the walls of caves often gave way, especially in times of heavy storms, leaving another side of the cavity exposed. Perhaps a wall had been produced in trying to repair the damage caused by the storm. At any rate, it came about that to build a wall

was found to be the proper way of replacing a natural wall. This discovery resulted in an application which made the present modified natural cave still more efficient, i. e., the introduction of built-in walls at the front of the cave, C.

For many ages the cliffs and rocky mountain slopes were undoubtedly the most popular places for dwellings. By building two walls up against a depression in the cliff a structure could be formed with but little effort. A roof might then be made of branches or of the skins of wild beasts, F. Had the house hunter been more fortunate in his finding, he would have selected a place where an overhanging cliff provided a roof, thus saving the extra labor of building one.

By the use of three walls a dwelling could be built up against any cliff. In this case more labor and skill were required, but man had grown in his ability to surmount natural obstacles.

The dawn of architecture had been experienced when man first learned to place stone upon stone. And yet for ages after this discovery men continued to build their houses among the rocks or against the cliffs. The second great epoch maker in architecture was he who discovered that four walls could be built to stand alone, without the necessity of leaning against the cliff. The four-walled independent structure, H, simple and primitive, may yet be regarded as the forerunner of the modern home.

The eight little structures described thus far are suggestive of one method of approach of the housing problem for the lower grades. Each of the little models is built on a ground of red clay which, when dry, resembles a fine red soil. This clay is also used to represent rock, excepting in those structures which can be made by using small pieces of stone. The foliage, branches, stones, etc., are gathered by the students. Each model is built upon a $\frac{1}{4}$ inch pine board, 8 inches by 12 inches, across each end of which a cleat of $\frac{3}{4}$ inch pine has been screwed to prevent warping.

The evolution from natural cave to the four-walled hut is nowhere better illustrated than in our own country. Extensive prehistoric remains of such structures have been discovered in the Pueblo regions of Arizona, New Mexico, Colorado and Utah. The preservation of these ruins down to the present day is due to the fact that they are to be found only in isolated localities where men have ceased to live. The dry climate, too, has had its share in preserving them. Ruins are often found upon the crests of high cliffs and even upon high hills and mountains. The placing of abodes in such inaccessible places was undoubtedly for the sake of protection.

The nature of man's occupation has ever been a strong determining factor in the matter of housing—it has dictated the type of dwelling most suited to his needs. A survival of the temporary hut of migratory man is still exemplified in our soldiers' shelter tent. In the case of the Navajo Indians, religion functioned in determining

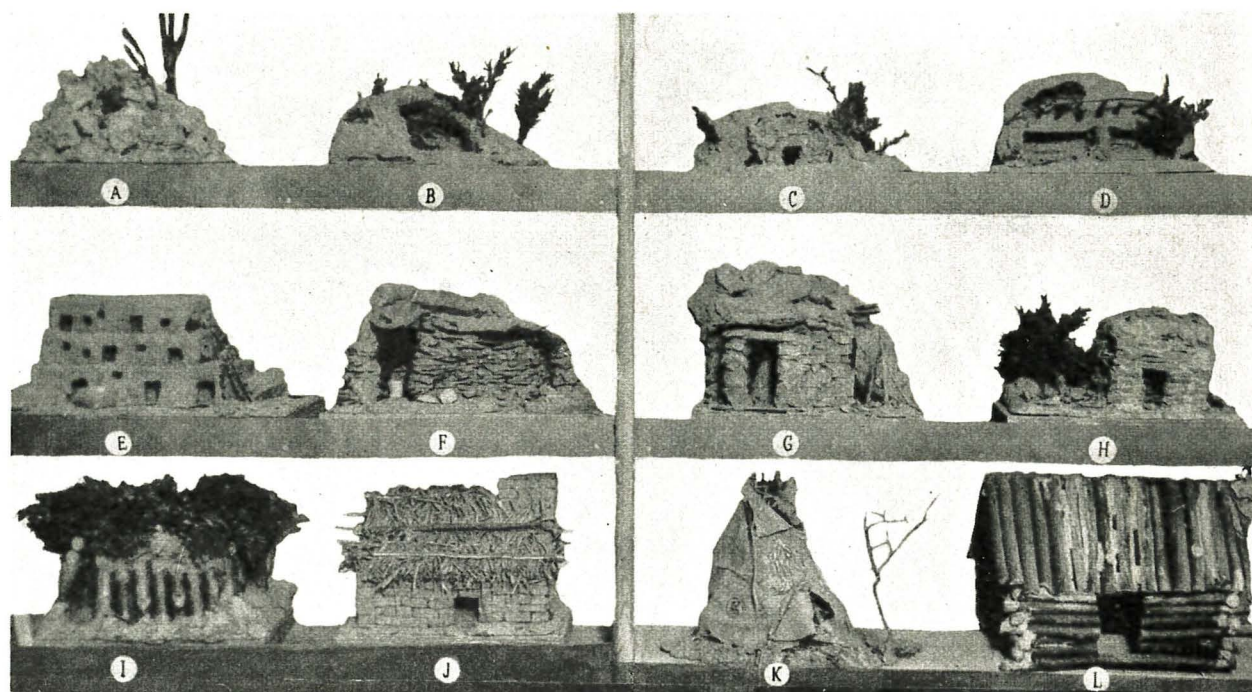


Fig. 1.

that the abode should be of a temporary character. Their superstition dictated that the hut be abandoned directly a death occurred in the family. The Navajo hut or *hogan*, I, was usually built of logs placed for the most part vertically. Clay was used as plaster in the construction of the walls and of the roof, which was built of the boughs of trees.

The wigwam of the American Indians is better known to most of us than the hogan, altho it is even less permanent in character. Wigwams could be moved from place to place with ease, should a change to a more plentiful hunting field be deemed advisable. The model, K, was made from twigs and chamois skin. The decorations were painted on in mineral colors.

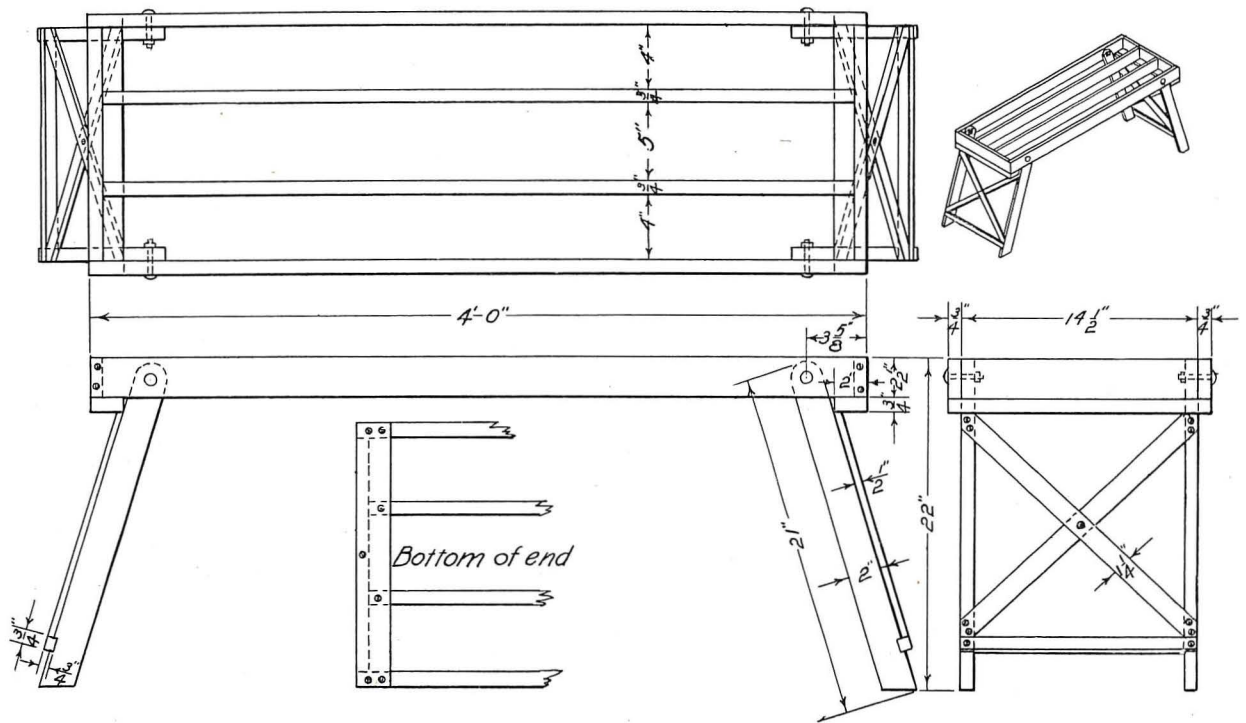
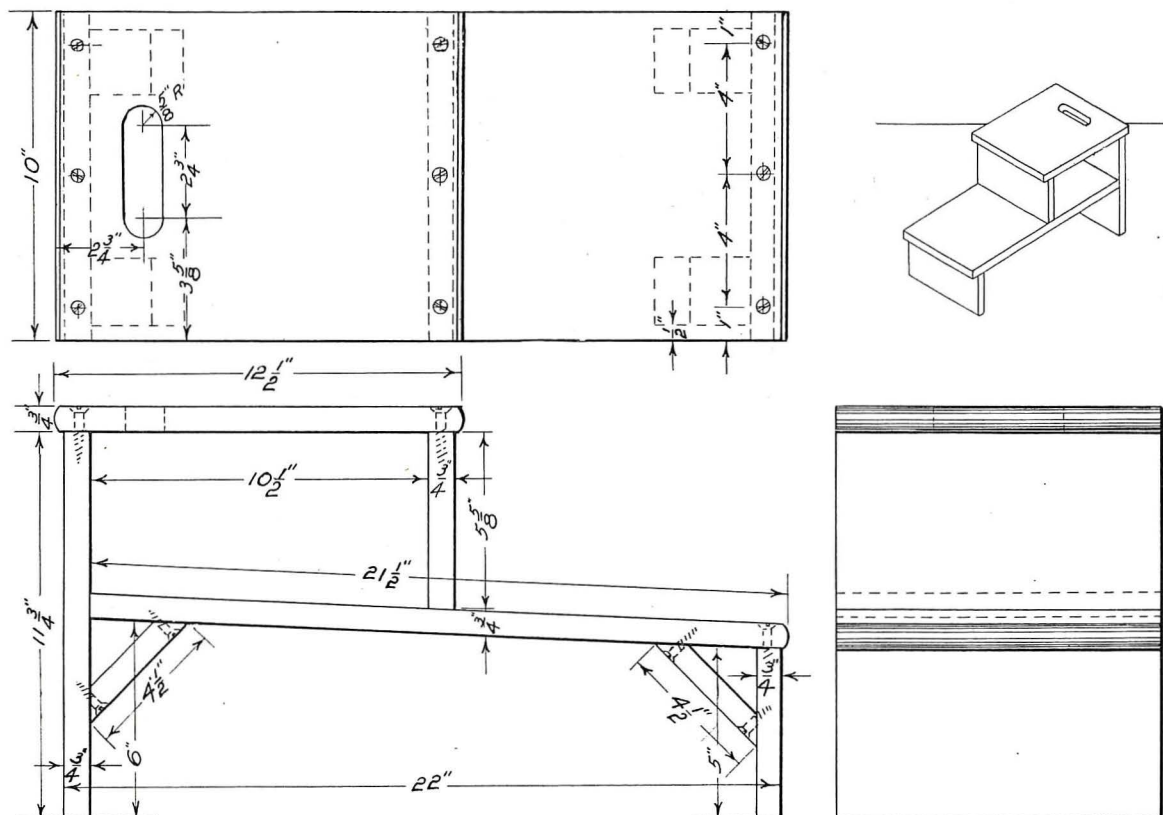
The early colonial settlers of North America employed several types of dwelling, two of which will be considered here. These early settlers brought no building materials with them from the other side and were thus dependent upon those which the new country had to offer. In the north the log cabin was adopted, logs being readily procured. But in the far south another material presented itself, quite different from wood, yet equally good under the different conditions. The material referred to is clay, and the sun dried bricks made of it were called adobe bricks. The early Spaniards who first settled in California not only built houses of adobe but many beautiful missions as well. Some of these are standing today. And yet adobe is not regarded as so permanent a material as wood, even for these dry climates. It is easier to handle, however, and much easier to procure in these localities. Adobe houses are often kept whitewashed to prevent the bricks from crumbling. The house, J, is a somewhat typical adobe structure, having a roof of thatch and a large chimney.

In Figure 2, we have five examples of modern building construction as worked out by the students at Pitts-

burgh. The structure with solid concrete walls, M, was built by pouring a mixture of 1 part cement, $1\frac{1}{2}$ parts sand, and 3 parts gravel into the form. The boards of the form are shown in the illustration. There was of course, both an inside and an outside form. The boards were nailed together in such a way as to be easily taken apart after the cement had hardened or *set*. After the concrete had been placed in forms it was not allowed to dry but was kept moist by covering it with wet rags until the mixture was thoroly hard. At least three days should be allowed for setting. The building shown in the illustration is a garage.

Concrete buildings are often made by the piling up of blocks of the material rather than by pouring into a wall form. The blocks shown in N are solid, altho it is now a common practice to make them hollow thus providing an air chamber which makes the wall less of a moisture transmitter. These blocks could have been cast hollow by the use of a *core* or wooden block which should be pressed down into the soft mixture. The block would have been tapered to facilitate its being removed after the mixture had set. A couple of the forms used by the students are seen in the illustration. Each form was made of $\frac{1}{4}$ inch basswood, requiring two pieces 2 inches by 2 inches and two pieces 2 inches by $4\frac{1}{2}$ inches. These pieces were oiled with linseed oil and they may be used over and over. In assembling each form, the nails are driven to within $\frac{1}{8}$ inch of their heads to allow for drawing them out. The blocks are kept covered with a damp cloth for about three days after which they may be placed in a dish of water until very hard.

Bricks for a brick dwelling may be made with a little machine similar to the one shown in O. A bottom piece and two side pieces or guides are fastened together with screws. Then two narrow boards aggregating in width the width of the bottom board are prepared. One

Folding Bench*Milking Stool*

$1\frac{3}{4}$ ", No. 10 screws at each joint. Bore holes for screws with 3-16" twist bit and countersink holes.

3. Fasten end lower cross piece by placing five screws as shown in the drawing.

4. Locate points for bolts on side pieces $1\frac{1}{8}$ " from top edge and $3\frac{5}{8}$ " from end and bore holes with $\frac{3}{8}$ " bit.

5. Bore $\frac{3}{8}$ " holes in legs at end for bolts.

6. Cut notch $\frac{1}{4}$ " deep and $\frac{3}{4}$ " wide in upper edge of legs 2" from end and fasten cross piece in place with one $1\frac{3}{4}$ " screw at each joint.

7. Lay out cross braces, making half lap joint at center and fasten with two 1" No. 7 screws at each joint, and one $\frac{3}{8}$ " screw at half lap joint.

8. Fasten legs to top with bolts.

MILKING STOOL.

Material Required.

Lumber: 1 piece white pine $\frac{1}{8}$ "x10"x5'-3".

Hardware: 15 flat head bright wood screws $1\frac{3}{4}$ ", No. 10. 16 flat head bright wood screws, $1\frac{1}{4}$ ", No. 8 for braces.

Stock Bill.

Pieces	Finished Dimensions	Use
1	$\frac{3}{4}$ "x10"x12 $\frac{1}{2}$ "	Seat
1	$\frac{3}{4}$ "x10"x11 $\frac{3}{4}$ "	Back Leg
1	$\frac{3}{4}$ "x10"x5"	Front Leg
1	$\frac{3}{4}$ "x10"x21 $\frac{1}{2}$ "	Pail Rest
1	$\frac{3}{4}$ "x10"x 5 $\frac{5}{8}$ "	Front Seat Support
4	$\frac{3}{4}$ "x 2"x 4 $\frac{1}{2}$ "	Braces

Directions.

1. Reduce all pieces to finished dimensions.

2. Round both ends of the seat and the front end of the pail rest to lines drawn across the stock on both sides $\frac{1}{8}$ " from the end.

3. Locate points on seat for hand hole as shown in the drawing and at these points swing circles with $\frac{5}{8}$ " radius. Draw lines tangent to the circles.

4. Bore a hole with $\frac{1}{2}$ " bit so that the outside of the $\frac{1}{2}$ " hole touches the outside edge of the circle and cut the opening with a coping saw.

5. Set the T bevel for the bevel cuts at the back end of the pail rest, the lower end of the front seat support, the upper end of the front leg and the upper end of the braces from the drawing and cut ends to the bevels. The lower ends of the braces are 45 degrees cuts and may be laid out by setting the T level at 45 degrees on the steel square.

6. Bore three holes for $1\frac{3}{4}$ " No. 10 screws at each joint spaced as shown in the drawing with 3-16" wood twist drill; countersink the holes and assemble the parts.

7. Bore 5-32" holes for screws in braces; countersink the holes and fasten the braces.

The stool may be assembled by using four 6d common nails at each joint and two 6d common nails at each end of each brace; however the screws are a better form of construction.

IRONING BOARD.

Material Required.

Lumber: 1 piece white pine $1\frac{1}{8}$ "x12"x5'-0".

1 piece white pine $\frac{1}{8}$ "x4"x3'-6".

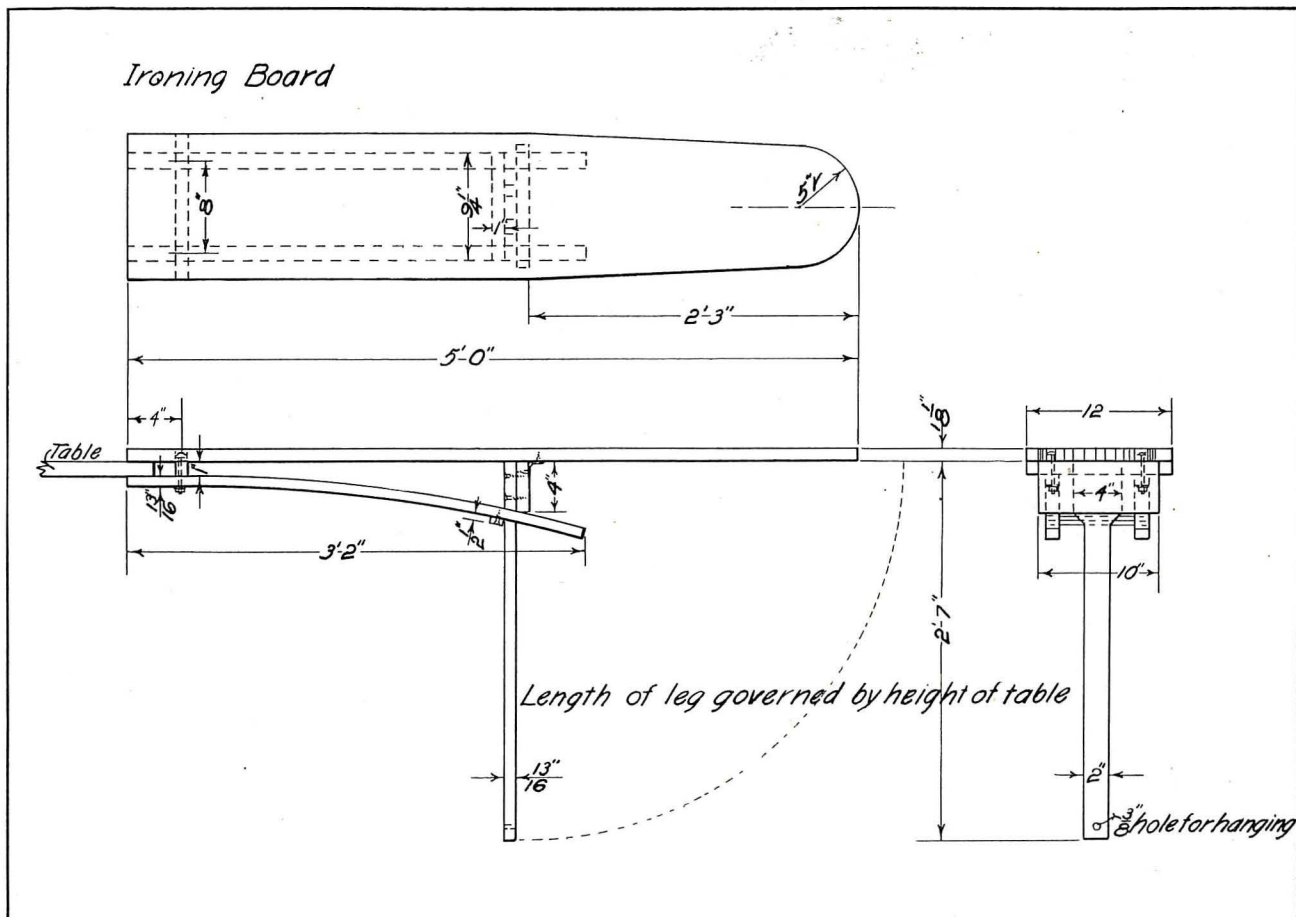
1 piece birch or oak $\frac{1}{8}$ "x1 $\frac{1}{4}$ "x8'-4".

Hardware: 2 carriage bolts $\frac{1}{4}$ "x2 $\frac{1}{2}$ " with 2 washers each.

4 flat head bright wood screws $1\frac{1}{4}$ ", No. 8.

2 flat head bright wood screws $\frac{7}{8}$ ", No. 7.

2 steel butt hinges, riveted with $1\frac{1}{8}$ " screws.



Stock Bill.		
Pieces	Finished Dimensions	Use
1	1 1/8"x12" x5'-0"	Board
2	1 1/8"x1 1/4"x3'-2"	Clamps
1	1 1/8"x1" x12"	Carting Strip
1	1/2"x1" x9 1/4"	Crossbar
1	1 1/8"x4" x2'-7"	Post
1	1 1/8"x4" x10"	Post and Hinge Support

Directions.

1. Reduce all pieces to finished dimensions.
2. To shape the board draw a center line lengthwise of stock and swing an arc with 5" radius on center line 5" from end.
3. Draw lines across both edges 2'-3" from the same end as the arc.
4. Remove stock to line with saw, draw knife and plane.
5. Locate points for bolts 4" from end and 2"

from edge and bore a 11-16" hole 1/2" deep on the upper edge of board.

6. Bore 1/4" holes thru the board in center of 11-16" holes, and thru the parting strips and clamps.

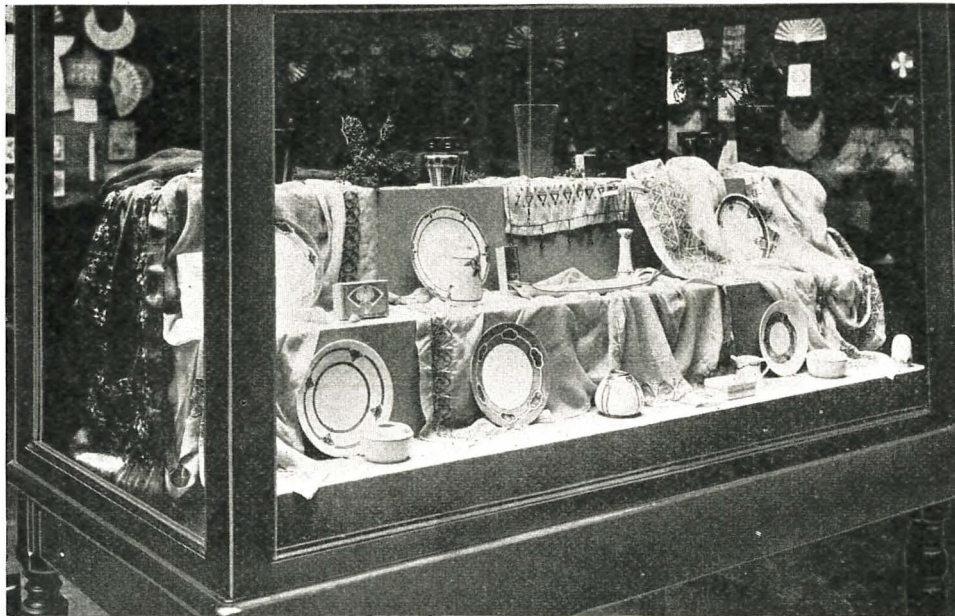
7. Bolt these three members in place and plug the 11-16" holes.

8. Fasten the post to the post and hinge support with four 1 1/4" No. 8 screws.

9. Cut a small groove in the lower side of the board and also in the edge of the post and hinge support for the joint of the hinges and fasten the hinges.

10. Place the board on the bench and the post standing up at right angle to the board and fasten the cross bar to the clamps so that it touches the post.

11. Bore the 3/8" hole in the lower end of post for hanging the board.



One of the cases of craft work and examples of China Painting from the Washington Irving High School, New York City High School Exhibition of Art in Relation to Women's work. See pages 271-272.

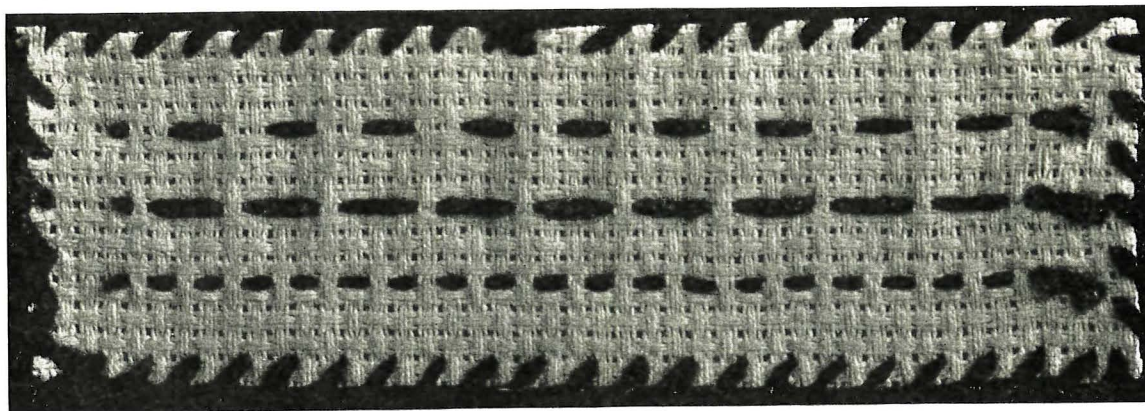


FIG. 1. BEGINNER'S MODEL.

DOMESTIC ART IN THE GRADES

Ada I. Gause, Supervisor of Domestic Art in Public Schools, Houston, Texas

THE courses of study outlined and developed in the following pages is an attempt to present the subject of Domestic Art in a simple, interesting and logical manner as a help to young grade teachers, some of whom are acting both as teacher and supervisor. Suggestions are offered for use in the establishment of new departments and in the reorganization of old ones.

In making out a course of study the following points should be considered:

1. The child,—its age, ability.
2. Sequence of lessons.
3. The general sewing principles to be embraced.
4. Use.
5. Cost of material.
6. Allotted time.

Where time is given for but one lesson per week, during perhaps three years of grade work, much thought is required on the part of the supervisor to arrange a course of study, which will give to the child cultural training, industrial application, excite enthusiasm and hold interest—each problem to be kept within the cost limit, and to be of as much usefulness as the above combined limitations will permit.

Precaution must be exercised not to allow the sewing problems to degenerate into the mere construction of something to please the eye, or to add numbers in the child's wardrobe. The making of garments is not necessarily educational. Unless the problems are sequential, each lesson hinging on to the previous one, embracing all the newer principles of the old lesson, and adding as many new ones with applied understanding, nothing in the way of training is being accomplished.

With training methods fixed and basic habits formed in the first year, the work must then be broadened by application both associated and practical; by textile study and by a simple knowledge of home economic conditions.

The grade work should give to the child, and to the parent, a keen appreciation of the meaning of Domestic Art, and should prepare it alike for a higher cultural education and special industrial training, or leave it resourceful enough to be self dependent for self development.

Following is an outline of a course of study suitable for the average child where much time and money are allowed:

L⁴

Beginners' problem,
Paint bag,
Patch model.

H⁴

Book cover,
Sewing bag.

L⁵

Dainty apron,
Button-hole model.

H⁵

Cooking apron.

L⁶

Kitchen and dining-room linens.

H⁶

Curtains and bed linens.

L⁷

Morning cap,
Sewing apron,
Collar and cuff set,
Textile study.

H⁷

Machine work,
Textile study.

This course is advisable for schools where less time is given, by extending it into the eighth and ninth years, so long as the sequence of lessons remains the same.

Items to be practiced daily until habits are formed, first in the teacher:

1. Use thimbles,
2. Do not bite threads, give reasons,
3. Do not use selvages, give reasons,
4. Do not tear materials, give reasons,
5. Remove bastings, give reasons,
6. Give tapeline drill.
7. Bear in mind that a given amount of work must be done in a given time,
8. Observe the work in the hands, with regard to neatness and position.

9. Observe the position of the child at the table.
10. Have all seats placed in the best possible position with relation to the light, which should come over the left shoulder,

11. Be careful that needles, thread and materials correspond in size.

Rule.—Ten times the number of the needle will give the corresponding thread number.

12. The sewing room slogan should be "neatness."

13. Dignify the work by teaching a respect for the sewing room, the equipment and all problems.

Fig. 1. Beginners' Problems.

Presentation of the Beginner's Problem is given in detail as a model presentation, and to illustrate what is meant by "Training Methods" and "Basic Habits."

Materials:

- Art canvas, 2 by 6 inches,
- Wool yarn, 2 yards,
- Embroidery needles, number 2.

NOTE.—A teacher should not present a problem of which she has never made a model.

Place lesson subjects on the blackboard previous to presentation.

LESSON I.

- I. Threading needle,
- II. Tying a knot,
- III. Tapeline drill.

Presentation of Lesson.

Demonstrate Threading Needle.

1. Hold needle in right hand,
2. Hold spool in left hand,
3. With left hand put thread thru eye of needle, 4 inches.

4. Carry spool to right elbow and break thread.

Break thread because it leaves a desirable end for tying knot. It also leaves the spool end more easy to thread.

Demonstrate Tying a Knot.

1. Hold thread firmly between thumb and finger of left hand,
2. Wind thread around finger once,
3. Twist threads together toward you and slip off of finger.

Illustrate Tapeline Drill.

A tapeline drill offers much opportunity for correlation with arithmetic. When given to children unfamiliar with fractions a simple understanding can be effected by addition and subtraction as by the following blackboard method, Fig. 2:

This method has been used with better results than that of using cardboard measures or by counting stripes or checks in the materials.

Fig. 2. Tapeline Drill.

1. Erase the long marks in the second inch (your tapeline remains the same).
2. Give each space a name, one-eighth,
3. Erase the a, c, e, g lines in the third inch,
4. Give each new space a name, one-fourth. Indicate by long marks, b, d, f,
5. Erase b and f lines. Give each space a new name, one-half. Indicate by drawing d line longer.

Review the drill frequently in class, tapeline in hands.

LESSON II.

- I. Even Basting Stitch,
- II. Uneven Basting Stitch,
- III. Tapeline Drill.

Presentation to Class:

I. Even Basting Stitch.—Spaces and stitches are of equal length, each $\frac{1}{4}$ inch. Uniformity produces strength. Illustrate on board.

Use.—To baste *hems* and *seams*. A stitch of some strength is required to hold them in place until a permanent stitch can be placed. Bastings are for temporary use only, and must be removed as soon as they have served their purpose.

II. Uneven Basting Stitch.—Stitch $\frac{1}{8}$ inch, spaces $\frac{1}{2}$ inch. Illustrate on board.

Use.—To hold two pieces of cloth together when strength of stitch is not required. Uneven stitches are not as strong as even stitches, but are more reliable than pins.

Instructions to the class:

1. Place a line of even bastings on the canvas model in hand,

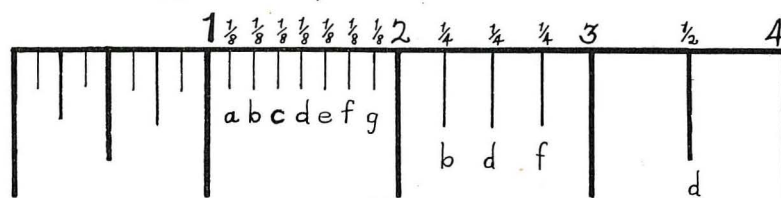


Fig. 2.

2. Begin in the fourth row of holes from top, and in the fourth hole from right hand edge,

3. Finish in the same row of holes and in the fourth hole from left hand edge, repeat last stitch and cut yarn.

4. Place a line of uneven bastings on model,

5. Begin in third row of holes below line of even bastings, and in the fourth hole from right hand edge.

6. Finish in fourth hole from left-hand edge—repeat last stitch—cut yarn.

III. Practice tapeline drill with pencil and paper, making even and uneven basting stitches.

LESSON III.

- I. Review Lesson II.
- II. Running Stitch,
- III. Overcasting Stitch.

Presentation to class:

II. Running Stitches.—Stitches and spaces are of equal length and as small as possible,—depends on weave of material. Illustrate on board.

Uses.—(1) For gathering, (2) For holding materials permanently together where a strong stitch is not necessary.

III. The Overcasting Stitch.—Is a slanting stitch taken very closely to edge of cloth. Stitches and spaces are each $\frac{1}{4}$ inch. Illustrate on board.

Start without a knot, secure end under second stitch. To join a new thread, place ends on edge of cloth and continue work.

Instructions to Class:

1. Place a line of running stitches on model,

2. Begin in the third row of holes below line of uneven bastings and in the fourth hole from the right-hand edge,

3. Finish by repeating last stitch,—cut yarn,
4. Place overcasting stitches all around model,
5. Join threads,
6. Finish with X X stitches.

Note.—Overcasting is a splendid finger exercise and as such will be given as the beginning lesson in the following model—The Paint Bag.

Fig. 3. Paint Bag. Patch Model.

The Paint Bag shown in Fig. 3a is the beginner's first sewing piece. The first problem having been a practice piece, the second one, in order to stimulate the child's interest, should be a constructional piece. The bag shown in Fig. 3 is used in school as a receptacle for the child's paint-box, brushes and pencils.

The Paint Bag problem should be handled by the teacher with exactly the same method as the Beginner's Problem. The formula suitable for all Domestic Art problems is as follows:

First. The steps in construction proportioned into lessons according to school program.

Second. Lesson subjects should be placed on board each lesson day.

Third. Present lesson to the class at the beginning of the lesson period. Make application of general principles involved.

Fourth. Keep the class working together. It is the only means by which class interest can be maintained, and affords opportunity for reviews and for presentation of the lessons.

Fifth. Never begin a new problem until the old one is finished.

Sixth.—Make your own models of new problems.

Seventh. Never allow a school term to close with unfinished work on hand.

NOTE.—A tactful teacher will find many ways to keep her class working together.

Material for Paint Bag:

Gingham 24 inches on warp, 6 inches on woof,
White linen tape,—1 yard, $\frac{1}{8}$ inch wide,
Needle Number 7,
Thread Number 70.

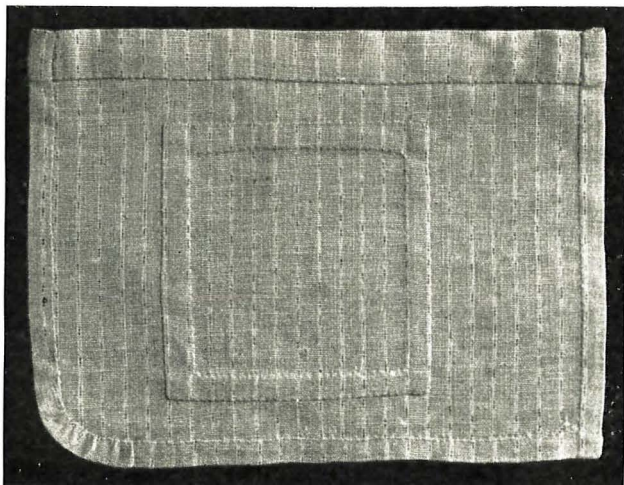


Fig. 3b. Patch Model.

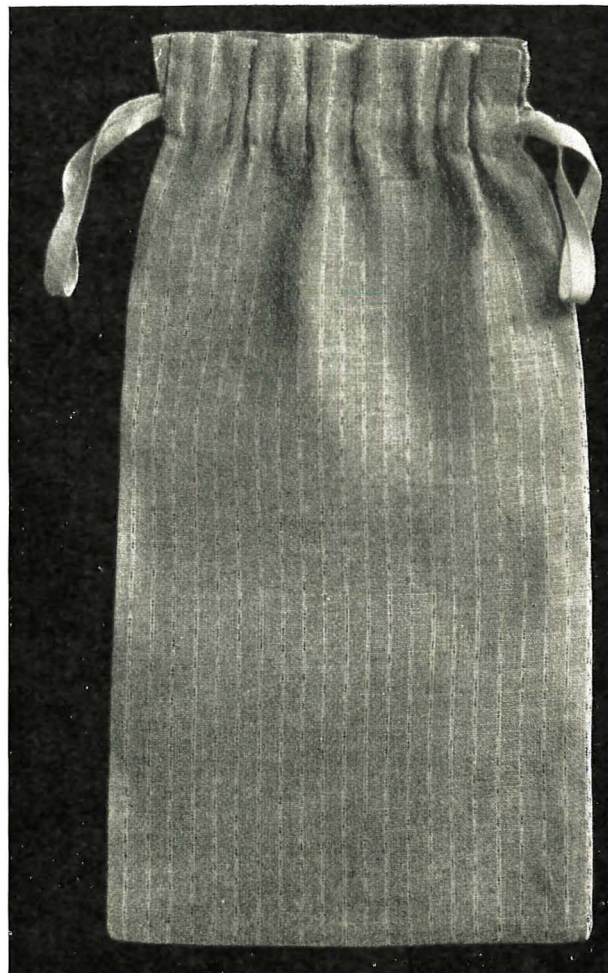


Fig. 3a. Paint Bag.

Steps in Construction:

1. Overcast side edges,
2. Fold side edges $\frac{1}{4}$ inch toward the wrong side and baste,
3. Fold material to form bag, ends together, side edges even,
4. Begin $2\frac{1}{2}$ inches from top, pin and baste sides together,
5. Overhand side edges as far as basted,
6. Remove bastings,
7. Turn edges $\frac{1}{4}$ inch across top of bag,
8. Turn again at top to form a hem $1\frac{1}{8}$ inches wide,
9. Baste hem,
10. Hem with vertical hemming stitch.

NOTE.—*Vertical Hemming Stitch* is vertical on wrong side, connecting warp threads in hem with those in material. On right side, stitch is small running stitch, shows but little, as it runs with woof threads.

11. Five-eighths of inch from top of bag, place a line of running stitches.

12. Overhand ends of hem above line of running stitches.

13. Draw in tapes,—one twice around.

NOTE.—In presenting the above lessons, make special features of the new stitches.

The Patch Model shown in Fig. 3b has valuable lessons, and prepares the way for the models which will follow.

Some Vocational Aspects of Home Economics

Cleo Murtland, Assistant Secretary of the National Society for the Promotion of Industrial Education



SHALL speak about practical education for girls who do not go to college or the high school and many who do not find it possible under present conditions to complete the elementary school course. There are thousands of these girls in the United States today, aggregating many times the number of women and girls found in the high school and the colleges. We need the high school and we need the college; we need academic courses and we need training in Home Economics for the girls and women in these schools; but we need also a kind of education and practical training that will reach the girls who may not have the advantages these schools give.

Earnest teachers of Home Economics are feeling very strongly the need of vocational courses. Everywhere I go, I am confronted by teachers of Home Economics asking "What can I do for the girl who has to go to work? I have ten, twenty, fifty, any number of girls who must go to work when they leave school. They like cooking, sewing, waiting on the table, and the other things that make up a course in homemaking. What can I do to prepare them for positions in these lines?"

College women taking a general course in Home Economics, exclusive of engaged girls and those preparing for teaching, are asking of their advisers the same question by the end of the first semester, the first year, and the second year: "I would like to specialize in some phase of Home Economics so that I may be prepared to accept a position when I am thru college." The problem is plainly a two-fold one—general training for use in the home, and specialized training for wage-earning and differentiation must be made if the girl who goes to work is to be prepared for the job she undertakes to fill.

The general course as preparation for the home has its place in every school preparing girls for life. The vocational school having for its aim, training for wage-earning, should include home-making courses in the general education program, but this general education has very definite limitations for the girls who go to work whether it be at 14 years of age, at 18 years of age, or 25 years of age.

They need preparation for the work which will enable them to give full value for the wage received and the power to command a living wage, plus a margin for right living. This requires specialization of the kind best suited to individual talents and capabilities. Find the talents and capabilities and then make courses to develop them. If the talents lead toward the occupations of the home and these offer employment possibilities, let the training be in that direction; if they lead toward selling, let the training be for store employments; if they lead toward business subjects as stenography and typewriting let the training be for commercial positions, for vocational training includes more than the industrial

subjects we have come to associate with the vocational school.

Many of the vocational subjects taught to girls have grown out of the occupations still existing in the home and are therefor home economics subjects as well as vocational subjects: The tea room, catering, waitress service, and the school-lunch have developed thru specialization in cookery courses. Dressmaking and millinery have grown out of these arts as originally carried on in the home.

The factory garment trades may also be said to have had their beginnings in the home, the migration to the factory having come thru the small shop with the advent of the power sewing machine.

The subjects primarily remain the same, but the aim and the methods of presenting the subjects differ. These two aspects are represented in the work of the two societies interested in the practical training of girls: The American Association for Home Economics with its homemaking aim, and the National Society for the Promotion of Industrial Education with its interest in wage-earning girls.

The wage-earning girls and the prospective wage-earners are interested in the home. They like what the home stands for, and thousands of them toil hard for the families they help to support. Many of them take courses in cookery, sewing, and other home economic subjects after the days' work is done. Girls engaged in the most mechanical kinds of work would, under favorable conditions, be interested in courses in cookery and sewing. The favorable conditions are (1) well organized courses, (2) a definite aim for each course clearly stated so that they can understand it—the advertiser's method of wording is most effective—and, (3) lessons presented and carried thru with snap and precision. Industry sets a standard of efficiency in doing things with little waste of time and energy that must be approximated if courses in cookery and sewing are to appeal to these young women.

Dressmaking is dressmaking and whatever grade of work is attempted let us teach the subject. The day for the class which permits pupils to make any garment they choose whether capable of doing the job or not, using the services of the teacher to fit, drape, or finish, to get skilled service for nothing, must pass. Such work is not instruction: It is not education and public money spent for such courses cannot be justified. The futility of such courses is proven by the vast numbers who fail to stick to the classes.

Educated women are needed in the factories and stores where these women work. College women—not the younger ones fresh from college and full of enthusiasm but with no experience or philosophy of life to meet the social and economic problems of factory work and life—but older women of thirty, or thereabouts, with well-trained minds, sound social interests, and ability to teach—can do great work as forewomen among the girls and women engaged in industrial pursuits.

You may not consider this teaching but in the right hands it may be made teaching of the very highest order. And it can be done. Mary Gilson of the Social Service department of the Clothcraft shop in Cleveland, with college women assistants acting as forewomen, is proving it. The trained woman in the store has already become a necessity. I look forward to the time when colleges and industry will co-operate in training women for such work, the college to give the theory checked by industry and its demands, and industry to give practical experience checked by the college.

Home Economics subjects have vocational aspects. The tearoom, the boarding house, the school lunch, demonstrate the commercial value of well prepared and

attractively served foods and the professional hostess, but it takes specialization which makes for efficiency to meet the requirements.

Dressmaking is dressmaking whether in home or the shop. It takes specialization to meet the needs of both and the home is coming to demand as high a grade of workmanship in dressmaking, other things being equal, as the shop.

The girl and the woman at work need and want the homemaking subjects. It remains to find more effective methods for getting their interest and holding it sufficiently to teach the subjects. The trained forewoman can be made a strong ally for the girls' vocational standards for that is her main job, and for the home interests which should be a definite part of her social service.



AN INTERESTING EXHIBIT OF MANUAL TRAINING WORK SHOWN BY THE DUNKIRK, N. Y., SCHOOLS.
Mr. T. G. Russell, Supervisor.

INDUSTRIAL-ARTS MAGAZINE

Board of Editors

WILSON H. HENDERSON Milwaukee, Wis.
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S. J. VAUGHN DeKalb, Ill.

EDITORIAL

AN ENLARGED VOCABULARY.

Not the least of the needs in teaching the Industrial Arts is careful attention to the use of trade technical terms, and the certainty that the meaning of words peculiar to industrial work is learned by the pupils in industrial courses.

The experience of one teacher is expressed in these words: "I have found each year by inquiry among my pupils that not only terms such as shade; shadow; value; hue; proportion; scale; dimension; projection; plan and elevation are not understood by my pupils who have passed thru drawing courses, but that it is necessary for me to explain, illustrate and drill into the minds of the pupils the meaning of these and other terms used by tradesmen such as lintel; sill; lug; jamb; corbel; casing; panel; stile; gauge; etc." Prospective tradesmen should certainly be taught the terms used in their trade. Some of us have gone thru the proverbial experience of the apprentice who is sent in search of the "round square" and the "left handed wrench."

The industrial vocabulary is unknown even to the college professor of English and it is not surprising that pupils in school who have passed thru the usual courses in English have not acquired terms of trade and industrial application, many of which are not found in the dictionary.

With careful attention to this important matter the Industrial teachers may add to our vocabulary a wealth of words and their meanings that should be common to the spoken and written language of an industrial people.

OFFICIAL INTERFERENCE.

OCCASIONALLY it is complained that superintendents interfere with the successful carrying out of the industrial arts work. This alleged interference seems to take the form of dictation in matters of courses, methods, equipments, etc. In some cases, fantastic ideas of universal correlation are pressed to such an extent as to make the shop work chaotic for the pupils and distracting to the teachers.

Wise supervision is desirable and necessary. But when the superintendent's supervision becomes dictation in the minutia of a specialist's work, it is clearly unwise and sure to defeat the very purpose of the work.

The wise superintendent will be considerate of the judgment and special fitness of the special teacher. He will be ready with kindly advice and suggestion; and especially with young teachers, he will be careful to permit such freedom of thought, method, course, etc., as will bring forth the best efforts and the surest results.

Beginning teachers of art, manual training, domestic science, etc., certainly have plenty to do to put into operation in a school system, the plans with which they are familiar. It is too much to expect, at the beginning, that they will get the work under way and at the same time be able to work out to perfection some utopian scheme of a theoretical superintendent.

Let us give the new teachers, especially, a chance to show what they can do without undue interference and with the kindly suggestion and advice of their superiors in office. Let us assume that, having had special preparation for their work, they can at least be permitted to get their work fairly started and their own ideas to working, before they are required to undertake strange and extravagant innovations.

SHIFTING THE RESPONSIBILITY.

A PECULIAR situation has developed in Philadelphia, which demonstrates one of the inconsistencies of attempts at universal education. The legislature of Pennsylvania recently enacted a law, which requires all children between the ages of 14 and 16 years, who are working on certificates, to attend school at least eight hours a week. Employers in Philadelphia have threatened to discharge all such children in their employ if the law is enforced. This would thrust upon the public schools of Philadelphia the task of caring for 20,000 children now working, and the schools are unable to care for this army of children without making it necessary for 60,000 children to attend school only half of each day, because of insufficient school accommodations.

By a "liberal interpretation" of the clause, stating that children shall attend school "if such school shall be within reasonable access to said place of employment," the school board hopes to escape the burden of caring for these children.

It is quite evident that when Philadelphia first began to provide education for all of the youth of the city, the authorities planned that a large portion of the children should leave at 14 years of age, and deliberately made all arrangements on this basis. The time has arrived for the city to demonstrate whether or not it was really serious in its attempts to provide "equal opportunity for all," and it is to be hoped that the board of education will find some method of caring for these children without seeking to evade the law.

VOCATIONAL EDUCATION IN ILLINOIS.

WHEN legislation on Vocational Education was pending in Illinois, the schoolmen were bitter in their denunciations of the so-called Cooley Bill. This bill provided for the dual control of school affairs. Occasionally, the ordinary school superintendent referred with apparent approval to another bill based on the unit idea of control. It was frequently pointed out by school people that there is nothing in the present school law of Illinois which prevents the establishment of vocational education courses and schools. The Lane Technical School of Chicago was quite properly pointed to as an example of what can be done in this line without waiting for additional legislation.

Since the "impending danger" of the Cooley Bill or of any other bill, has at least temporarily passed, we wonder how much is being done by these school officials to do what they said they could do under the present statutes. So far as we can ascertain, almost nothing of an effective nature is being attempted, except in a very few instances. This being true, the school people, who admitted the pressing need of vocational education, lay themselves open to the charge either of being insincere in the matter, or of lacking in the knowledge necessary to proceed with the work. In either case, their position in the matter is not at all an enviable one.

The best way for the schoolmen of the state to keep the confidence of the public and to prevent what they regard as freak legislation, is to show their interest in vocational education by their own initiative without having to be prodded into it by outside influences. If the schoolmen of Illinois should vigorously take up the task of vocational education and show what they can do without waiting for coercive legislation, they would have and would merit the confidence of the public, when legislation is again proposed. If, however, they sit idly by and make no effort, they need not be surprised if the public should doubt their interest and sincerity in the movement and turn to other forces for the solution of the problem.

SCHOOL COSTS.

IN the October issue of the "School Review," Dr. J. F. Bobbitt of the University of Chicago, gives a comparative cost of the various subjects taught in high schools.

The study deals with a single item of instruction in 25 high schools in the Middle West. Among a number of interesting points, the study shows the following to be the median cost per one thousand student-hours of instruction:

Shopwork	\$93.00
Normal training	92.00
Latin	71.00
Commercial subjects	69.00
Modern languages	63.00
History	62.00
Household occupations	61.00
Science	60.00
Mathematics	59.00
English	51.00
Agriculture	48.00
Music	23.00

Thus, shopwork is the most expensive subject taught in high schools. If we consider this table of costs as indicative of the worth of the subjects, we find that science and the "live" languages are placed lower than the "dead" language.

The point of most importance to teachers of shopwork is that their subject is the most expensive one in the curriculum. If we would consider the money expended in education as an investment rather than a cost, this fact is not in any way alarming. The point to be considered is whether or not the money invested in shopwork instruction is yielding sufficient returns to justify the expense. The report states that "the most expensive subject per thousand student-hours is Manual Training. For this, too, the average salary paid is the highest.

"A general dissemination of information as to the average salaries paid for different subjects ought to have in

time, an influence in regulating the supply of teachers, so as more nearly to equate the salaries paid. None of these average salaries is high, but it is difficult to justify the difference between household occupations at one end of the scale and shopwork at the other. There probably can be no real reasons for paying teachers of English and of modern languages so much less than teachers of mathematics and science, except that the supply of teachers for English is greater than the supply for the other subjects. Science and mathematics are so much less remunerative than shopwork for the same reason. While all salaries ought to rise, the equation of salaries can be brought about automatically by a general diffusion of information as to the different levels of remuneration in the teaching of different subjects, thus encouraging fewer to take the subjects which pay less and encouraging more to take the subjects that pay more."

In other words, Dr. Bobbitt thinks that the proper procedure is to induce a large number of people to enter manual training teaching, and thus bring salaries down, and to discourage people from taking up the teaching of subjects that are not so well paid in order to bring those salaries up. On this point we cannot agree with him, as his report states that the average salary of manual training teachers is \$1,140.00 per year. If it is desirable to bring manual training salaries down, this might be accomplished by inducing more people to enter this work, but in this connection it is to be noted that the salary of a good mechanic is somewhat better than \$1,140.00 a year. If salaries of teachers are lower than this, then men who are capable of making a living as mechanics will leave manual training work, and those who are left will be those persons who cannot do better elsewhere.

THE DEMOCRACY OF ART.

"MY New Art Creed," by Bonnie E. Snow, published in the September School-Arts Magazine, is a creed which every Industrial Art teacher may well adopt, and the adoption of such a creed carries with it the obligation to follow conviction by practice, precept and example.

"The Democracy of Art" is a fine term. We believe with Miss Snow in each and all of her expressed beliefs, and thank her for her optimistic and clear expression of them. As we read them we can almost see the millennium. We turn from them to the duty at hand with an increased sense of responsibility, for we know there is much to be done:

Before—"the ordinary individual may see the application of art principles to the affairs of his occupation, his business, his profession, and his home.

Before—"art is shorn of its mystery and vagueness, and takes its place as a teachable and demonstrative science possessing a quality that is inherently divine.

Before—"public school teachers apply to the teaching of art the same pedagogical intelligence, the same common sense, the same preparation, and the same tests that are applied to the studies of language, mathematics and the sciences.

Before—"the results from the teaching of art are definite and tangible, and the cultivated emotions and the trained intellect find expression in those inevitable selections of form, proportion and color, which tend to make our material environment more beautiful.

Before—"beauty comes back to the useful arts, and the distinction between fine art and useful art is forgotten."

PROBLEMS AND PROJECTS

THE Department of Problems and Projects, which is a regular feature of the *INDUSTRIAL-ARTS MAGAZINE*, presents each month a wide variety of class and shop projects in the Industrial Arts.

Beginning with January, 1916, the Magazine will award a monthly prize of \$10 for the best problem used in the Department. This is not a prize contest in the ordinary sense. Every problem accepted for publication will be paid for. The prize will be simply a reward of merit.

From the material submitted by readers, the Editors will select each month for the award one problem of especial merit, judged from such standpoints as originality, good construction, artistic merit, adaptability to school work, and quality of drawings and photographs submitted.

The brief description of constructed problems should be accompanied by a good working drawing and a good photograph. The originals of the problems in drawing, design, etc., should be sent.

Problems in *benchwork, machine shop practice, turning, patternmaking, sewing, millinery, forging, cooking, jewelry, bookbinding, basketry, pottery, leather work, cement work, foundry work*, and other lines of industrial-arts work are eligible for consideration.

Drawings and manuscripts should be mailed flat and should be addressed:

The Editors, *INDUSTRIAL-ARTS MAGAZINE*,
Milwaukee, Wis.

PORTABLE LAMP.

Ray H. Gould, Ashland, Wis.

THE PORTABLE READING LAMP illustrated on page 267, has been found an excellently practical project both from the standpoint of utility and experience, and best adapted to the ninth grade course of study. Not only is it a good drill in the jointing processes, but it is a splendid project with which to illustrate the elementary principles of design.

The standard (which is made first to save time in the drying of its glue) is built up of two pieces of solid material as wide as the thickness of the cross bar, grooved on their inner faces to admit the wires. They are glued together, and upon the sides showing the joint, strips of $\frac{1}{4}$ inch veneer are applied. The veneer must extend sufficiently above the core to be finished with the cross bar which fits snugly between the top ends.

If a band saw is not at hand, the base may be constructed as follows: Take a block a little wider than the base, two times the thickness of what may be termed the foot, (Fig. 2) and two times as long as the foot. Bore an $\frac{11}{16}$ inch hole from the center of one edge to the center of the other. Rip the piece from end to end and across

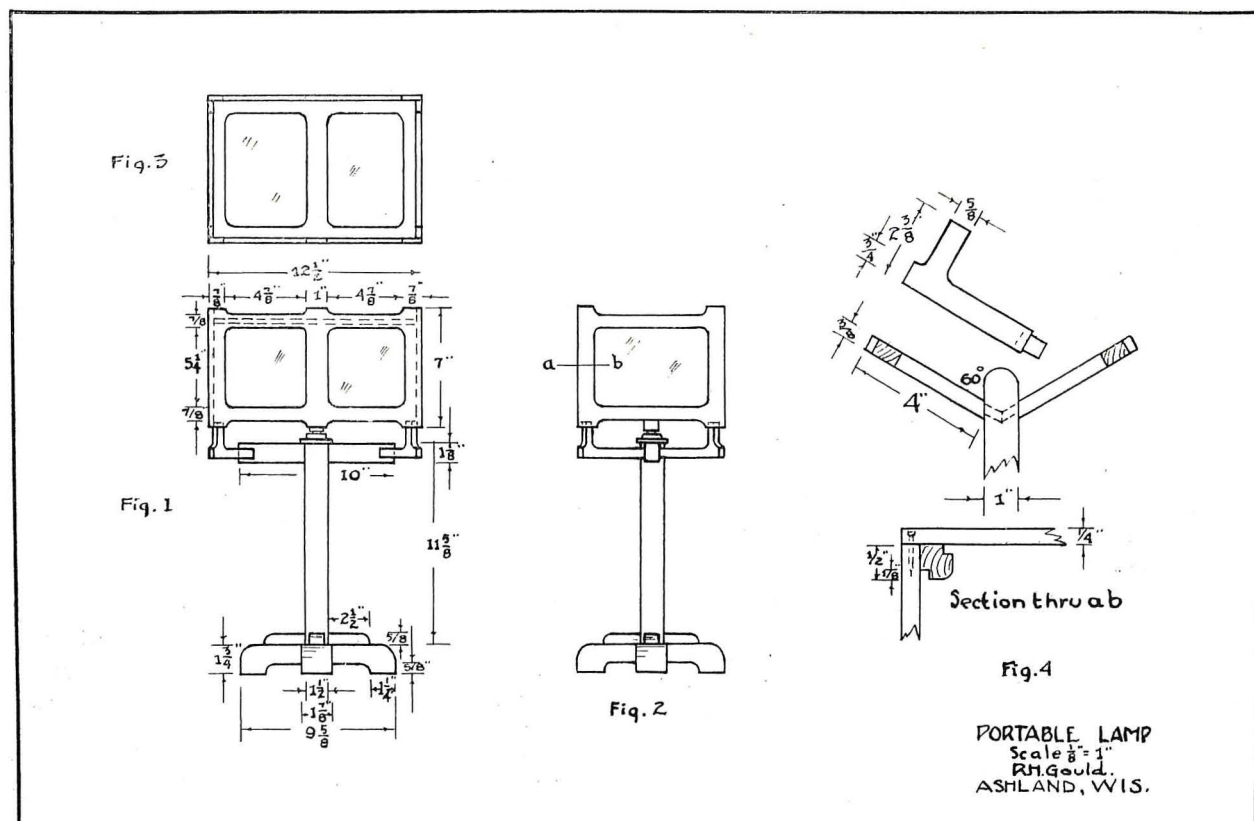
and you may glue the four resulting pieces on to the under side of the base proper to make its feet. When dry the corners may be rounded as in illustration. Join the two parts of the base with a half lap joint.

After the completion of the standard and base they may be assembled with a mortise and tenon joint.

The construction of the cross bar and supports is shown by illustration, Fig. 4. The supports are mortised with the cross arm by either a blind wedged joint or a plain tenon. The shoulders being at an angle of 60 degrees it is not a difficult joint to lay out.

In making the shade we used $\frac{1}{4}$ inch stock, selecting the brash pieces where possible, to prevent cracking. Square up each piece perfectly and lay out the desired shape. As the radius of the arcs forming the corners is $\frac{3}{8}$ inch, we used a $\frac{3}{8}$ inch bit to bore the holes in the corners and sawed between the holes with the coping saw. Assemble the sides of the shade with brads making sure that it is perfectly square.

The corner beads (see illustration, Fig. 4) serve a three-fold purpose. They hold the glass in place, keep the top of the shade, from falling, and hold the shade on the bar supports.



We found glue sufficiently adhesive to withstand the strain.

We lined the shade with either glass or silk. The glass method is by far the simpler as the wire frames upon which the silk must be strung require great care in fitting. It is not advisable to attempt the wire frame construction without the use of a soldering outfit.

A three-eighths inch hole may be bored down thru the cap to admit a short bushing to hold the socket in place.

MAKING AND REPAIRING CHRISTMAS TOYS.

Elmer W. Christy, Cincinnati, Ohio.

Early in December, 1914, when the Salvation Army undertook to distribute toys to the poor children of Cincinnati, the boys and girls of the Public Schools were asked to contribute old or discarded playthings.

In response to this request, nearly five thousand pieces were brought in to the various shops of the schools where they were repaired or redressed by the boys and girls of the manual training and domestic art classes.

In many of the centers, new toys were made and willingly given to the committees in charge. On the afternoon of December 24th, these new and madeover toys were piled on the base of an immense Christmas tree in the Music Hall, and distributed to children that had gathered to receive them.

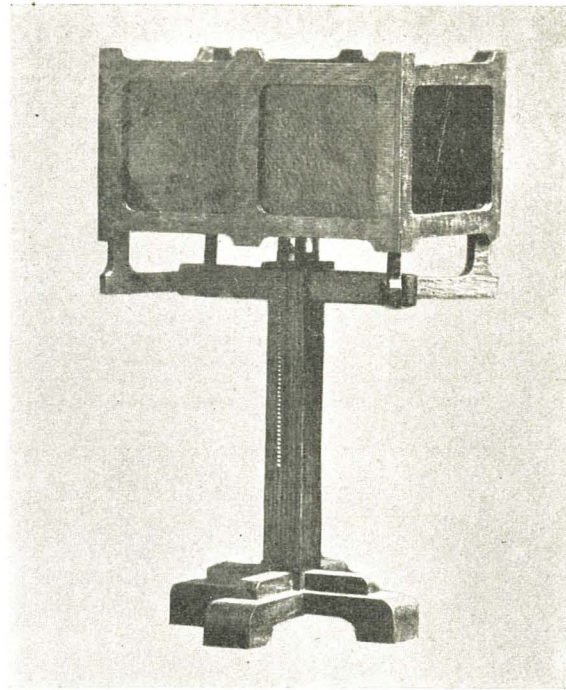
So great was the enthusiasm of those who gave, and the joy of those who received that undoubtedly a similar effort will be made this year. The accompanying cut shows some of the toys that were made by the grade boys.

MAKING A UKULELE.

By J. E. Bangerter, Los Angeles, Cal.

DURING the past two years the musical world has received a new instrument. The bringing of the Ukulele to the Pacific Coast States has created much interest. It is used in accompanying the voice in the native Hawaiian melodies or in other Popular Airs. It is an instrument that can be played with only a little instruction. The construction is so simple that many students in Manual Training Shops of Southern California have made their own instruments.

Being a teacher of Manual Arts I became interested in the making of the Ukulele and found that the instrument would be a good project for advance grade or high-school students to make, provided careful instructions

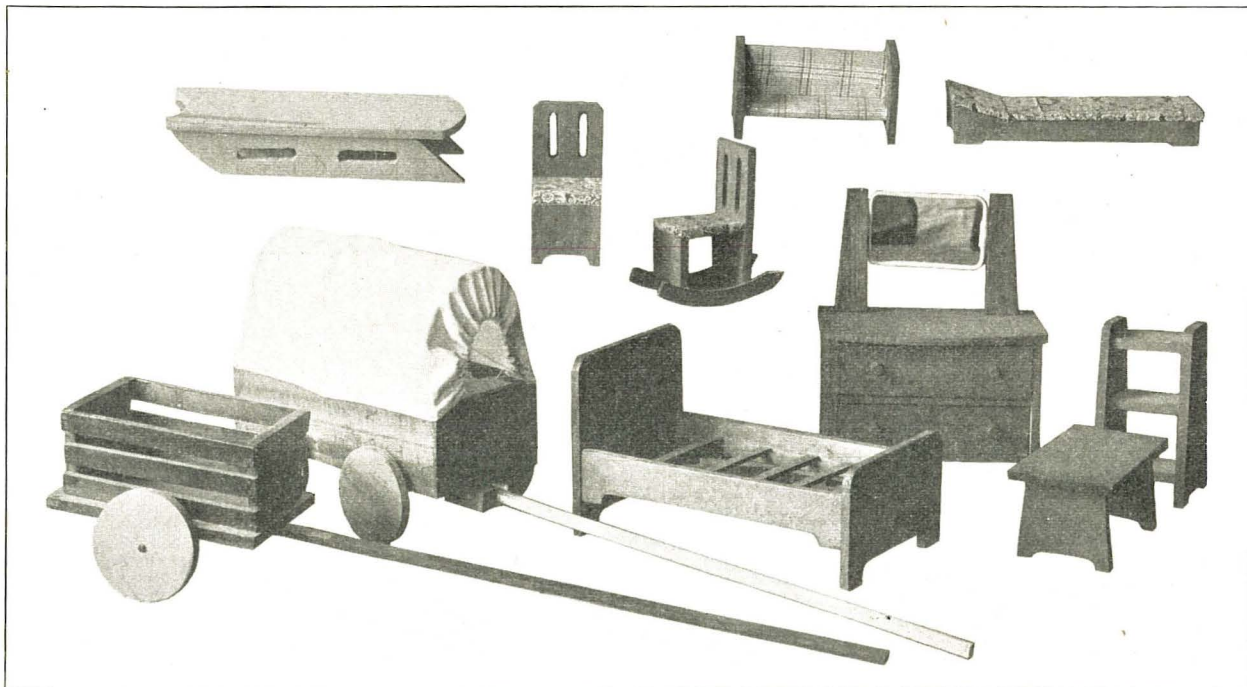


Lamp Made in the Ashland High School.

were given. The following is the method that I used in the Carroll Park School of Long Beach, California, and found it to be both satisfactory and practical.

Materials Required for the Ukulele.

- 1 Pc. Tobasco Mahogany $1\frac{1}{2} \times 2\frac{1}{4} \times 12$ " net S4S Neck.
- 1 Pc. Tobasco Mahogany Veneer $\frac{1}{8}$ full x $6\frac{1}{2} \times 20$ " net S2S Top and Bottom.
- 1 Pc. Tobasco Mahogany Veneer $\frac{1}{8} \times 2\frac{1}{4} \times 27$ " Sides.
- 1 Pc. White Pine $\frac{1}{2} \times 6 \times 20$ " S2S Support, Braces, etc.
- 1 Pc. White Pine $\frac{1}{2} \times 2 \times 2\frac{1}{2}$ " S2S Sounding Post.
- 1 Pc. White Pine $\frac{3}{4} \times 10 \times 14$ " S4S Clamping Board.
- 1 Pc. White Pine $2\frac{1}{4} \times 10 \times 14$ " S4S Form.
- 1 Dozen Frets.
- 1 Violin A String.
- 1 Violin E String.



SOME OF THE CHRISTMAS TOYS MADE IN THE MOUNT AUBURN AND HOFFMAN SCHOOLS, CINCINNATI, O.
Mr. E. E. Linxwiler, Instructor of Manual Training.

Directions.

The first part to make is the form for the bending of the sides of the Ukulele. The form will require a piece of wood $2\frac{1}{4}$ by 10 by 14 inches in size as stated in lumber bill. Lay out the outline of the Ukulele body as shown on drawing. Make the slant required before the form is sawed out. In sawing, be sure to use a saw that has enough kurf that will be equal to the thickness of the veneer. After this form is made we are ready for the bending of the sides. Take a piece of string or paper and measure the distance around the outside of the inside of the form, to find out the exact length of the strips of veneer that are required for the sides. Cut them to the dimensions found and boil in water or steam for one hour, when they will be ready to put in the form. Be careful not to let any blisters form when clamping. Use two bar clamps to hold form together and do not remove clamps for 24 hours. The surplus wood may then be removed and the clamps taken off being careful to mark the edge that is to join the top of the Ukulele, so there will be no mistake when the neck and the sides are glued together.

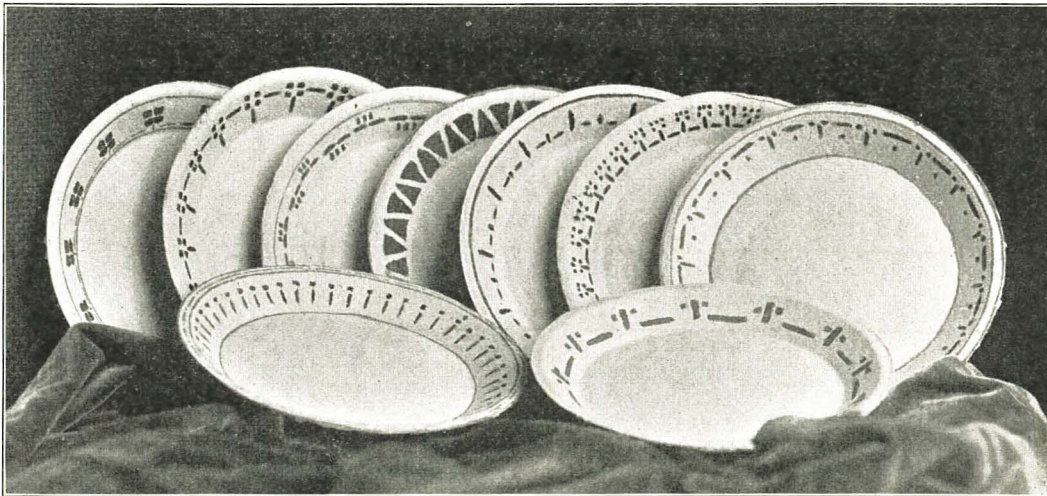
While the sides are drying, the neck, sounding post, supports, braces, keys and bridge may be made according to the drawing.

the $\frac{5}{8}$ inch board and trace the outline of the body of the Ukulele as shown in drawing. Make another line $\frac{1}{4}$ inch inside of this outline which will be the required line to saw on. This leaves the outside piece whole. This follow board will allow the back to rise and help to make a good joint at the same time. Before gluing on back, moisten it with hot water to make it bend easier, and then clamp on tight. Dry out back by holding over a fire and then remove clamps. It may now be glued and clamped again and allowed to dry for 48 hours. Wedges may be driven between follow board and back to help make a better joint.

The frets and bridge may then be glued on after the top and back have been trimmed even with the sides, and the Ukulele sandpapered all over until all the mill and tool marks have been removed.

Finishing the Ukulele.

After it has been sandpapered give the instrument a heavy coat of boiled linseed oil, and then put on a coat of paste wood filler. Rub this filler in good with the hands; and then remove the surplus with a rag and allow to dry over night. Several coats of shellac or varnish may then be put on, rubbing down between coats with pumice stone and finishing with rotten stone. If a flat



PAPER PLATES DECORATED IN THE OTTUMWA, IA., SCHOOLS.

The sides are fastened to the neck by making a saw cut just large enough to let the veneer slip into and then glued. Also glue in the sounding post and leave the glue set over night. In order to get the sounding post in the center, measure half the distance around the side by the use of a string or a strip of paper. The supports which are made out of the $\frac{1}{4}$ " piece of white pine may now be glued in around the sides; their shape being traced from the inside of the form used in forming the sides. After the glue that holds the supports to the sides has set, the braces may be mortised in to the supports by making a half lap joint and gluing.

To make the top: Trace from the form the shape of the top and back on the piece of mahogany 6 by 20 inches and allow about $\frac{3}{8}$ inches all around the outline drawn, as it will be easier to make the exact size after it has been glued on. Cut out the hole and then glue to sides. When gluing on the top, be sure to keep the center of the neck and the body of the Ukulele in a straight line and lying in the same plane. To do this clamp the instrument to a long, flat board. Leave the instrument set over night and then remove clamps.

We may now proceed with gluing on the back. In order to get the desired curve in the back a device for clamping will have to be made which is as follows: Take

finish is desired use water with pumice stone, or oil, if a polish is cared for.

Note—The word ukulele is pronounced u-ku-lay'-lee.

DECORATING PAPER PLATES.

Miss Georgiana L. Canfield, Supervisor of Drawing, Ottumwa, Ia.

THE teachers of domestic science and drawing had asked the other teachers in the building to come to the drawing room for a "spread" after school. The pupils of the former were to prepare the "eats." The pupils of the latter wanted some part in the fun also. The paper plates that were to be used gave the drawing teacher a suggestion. Why not decorate them? Quite an extended study in house furnishings had previously been made; here was an opportunity to study china design. Each pupil was asked to design several borders that could readily be made with brush strokes without pencil planning as it was found that the "china" would not stand erasing and time was limited. Each one chose her best design and decorated one or more plates. Several finished three after making their preliminary sketches and before the end of the 45 minute period. The color chosen was a soft gray-green to match the dominant color in the room. The plates were the common two-dozen-for-five-cents variety.

ITEMS OF CURRENT INTEREST

COLLECTING FOR MATERIALS.

C. C. Sinclair, Fredonia, Kans.

IN manual training schools in which the boys are required to pay for the materials used the question of collecting pay for the material has always been a source of trouble and inconvenience. I have often been asked as to how I succeed in collecting the bills owed by the students for materials used in the manual training depart-

[illegible]

Fig. 1. Record Card.

ment. To this question I will say that I always collect at the time the student makes the purchase and I have always found that a small bill is easier to collect than a large bill that has accumulated from small purchases.

I have tried several methods for collecting and with varying degrees of success. One method I have used was to collect from the student at the end of the term the amount equal to the value of the finished product. This

<h1 style="margin: 0;">BOARD OF EDUCATION</h1> <h2 style="margin: 0;">School District No. 40</h2>		
To.....		Grade.....
Hardware.....		Date.....
Lumber.....		
<div style="position: absolute; left: -10px; top: 0; bottom: 0; width: 10px;"></div> <div style="position: absolute; right: -10px; top: 0; bottom: 0; width: 10px;"></div> Multiple horizontal lines for writing		
COST.....		

Fig. 2. Bill Form.

Note—The above articles descriptive of plans for collecting for materials have been prompted by a question in the November issue of the magazine.

I have found to be entirely unsatisfactory. Another method I have used with fair results is what I call the card system.

In this we had blanks printed like No. 1 which is the card to be made out by the boy. Then we have sale blanks, in duplicate, like No. 2. At the beginning of the term I always appointed some trusty member of the class to act as salesman, for the class.

All of the students are required to make out bill No. 1, which as you will notice, is a bill of materials. This bill I have the student bring to me for correction, and together we go over and check it for mistakes. When the bill is checked it is given to the sales student who supplies the materials as called for and at the same time makes out bill No. 2 in duplicate, keeping one copy and giving the other to the purchaser. This sales student does all of the collecting. When using this method we usually collect about 95 per cent of the sales. This method I have partly discarded on the grounds that some of the students have been inclined to think that it shows favoritism. The system I am using now is the same as above except that the student who has charge of the lumber room does no collecting.

At the beginning of the term each student enrolled in the manual training department is required to purchase from the school a coupon book and coupons to the amount purchased are removed in payment for materials. At the end of the term the unused coupons are redeemed by the school. I have found this to be a very satisfactory method.

If any question arises between the purchaser and the sales student in regard to the price or measurements I always send the student to the lumber dealer to make his purchase. After making one purchase of this sort the student seldom, if ever, gives us any more trouble.

THE FORT WORTH METHOD OF COLLECTING
FOR MATERIALS.

By C. M. Haines, Supervisor of Manual Arts, Fort Worth,
Texas.

IN the Fort Worth Schools, the Manual Training Shops are self-supporting in regard to material and supplies purchased. The equipment and teachers are furnished but the shops themselves are self-supporting. At

DEPARTMENT OF MANUAL ART
FORT WORTH PUBLIC SCHOOLS
NOT TRANSFERABLE

ISSUED TO _____
NOT GOOD UNLESS
SIGNED BY C. M. Haines

\$2.50 COUPON BOOK NO. 17

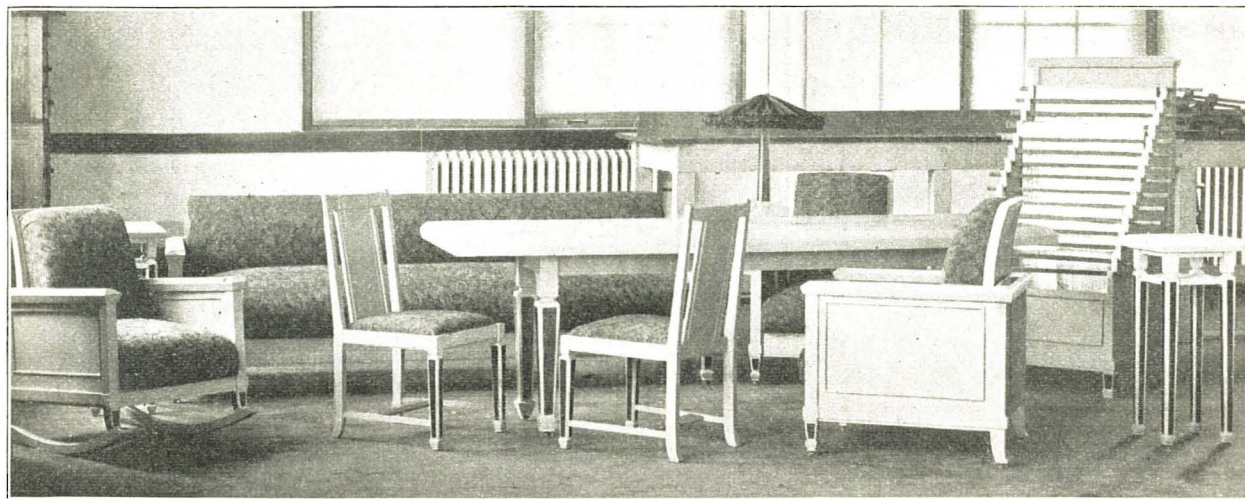
HARVEY'S BOOKS, PRINTS, ETC.

Good for 5c
Fort Worth Public Schools
Department of Manual Arts
Not good if detached

Good for 10c
Fort Worth Public Schools
Department of Manual Arts
Not good if detached

first a card index system was used, the boy paying for his material when the project was completed. This complicated matters a great deal and there was a loss of interest on the investment in material by the board of education.

As a solution of this problem, we adopted a coupon book system. The book, as illustrated, sells for \$2.50 and may be cashed in at any time for material for that



FURNITURE MADE AT THE OSHKOSH NORMAL SCHOOL, OSHKOSH, WIS.

The furniture for the parlors of the Wisconsin Building at the Panama-Pacific Exposition was made in the shops of the Oshkosh State Normal School, Oshkosh, Wis. The pieces consisted of two eight-foot davenport, one eight-foot table, four taborets, two newspaper racks for twenty papers each, eight easy chairs, three rockers, two straight-backed chairs, a reading lamp and forty newspaper holders. The pieces were made during the winter of 1914-15 and served in the Wisconsin Building thruout the year 1915.

All of the furniture was made of birch with black walnut veneer trim. It was finished in a light gray enamel, rubbed to an egg shell to harmonize with the wood trim of the building. The upholstery was in subdued shades of gray-green olive and red.

The pieces were designed and made under the direction of Mr. Hans Schmidt.

amount. Inside the book are coupons of five and ten-cent denominations. This system means that the pupil makes the investment and loses the interest for the time he is working on his project. While the individual investment is never more than seven or eight dollars, at the most, the total investment by the board is a great deal.

When the coupon book system was first introduced into the Department, there was some objection on the part of some of the older pupils who had taken work in the shops at a previous time, but as they could put forth no logical reasons why this method should not be used, their objections were soon overcome.

The books have been obtained from the local printer in Fort Worth. They are issued in lots of 500, at a cost of \$14.

COLLECTING BILLS IN VANCOUVER, WASH.

By A. G. Sulak, Director of Manual Training, Vancouver, Wash.

For over five years I have had money to collect from boys in the grades, as well as in the high school, for lumber and drawing supplies, and have found very little trouble getting it.

My method is this: I tell the boys that I do not care nor have not the time, to keep books and accounts and therefore they must pay when they take the article home. Before a boy begins an article the price of material is figured and he understands that when it is finished it must be paid for, or he is not allowed to take it home until the amount is paid.

I find this method quite satisfactory. Some students pay for the material even before the work is finished.

PRINTING EXHIBITION AT SPRINGFIELD.

An exhibition of the work of commercial printers from all over the world, and of school printers from all parts of the United States, was held during the week of October 4th at the Springfield Vocational School, Springfield, Mass. The exhibition, so far as is known, was the first of its kind in Springfield, if not in the United States. It included the work of schools from Boston to California and demonstrated the advance of the art of printing in all its phases.

The exhibits were mounted on large cards and were shown in the printing department and in the corridors of the school where special exhibition frames had been erected. Most of the specimens were executed in two and three colors and splendid examples of off-set work,

original drawings, wood engravings and three-color plates were included.

A feature of the exhibit was the display of Japanese paper work. There were also some interesting exhibits from English, German, French and Italian print shops, illustrating one, two and three-color work. In addition, the local print shops and the printing department of the Vocational School had exhibitions of their work. Mr. Lester I. Dygert, head of the printing department of the school, had a personal collection which had never been shown in public. It attracted a good deal of attention.

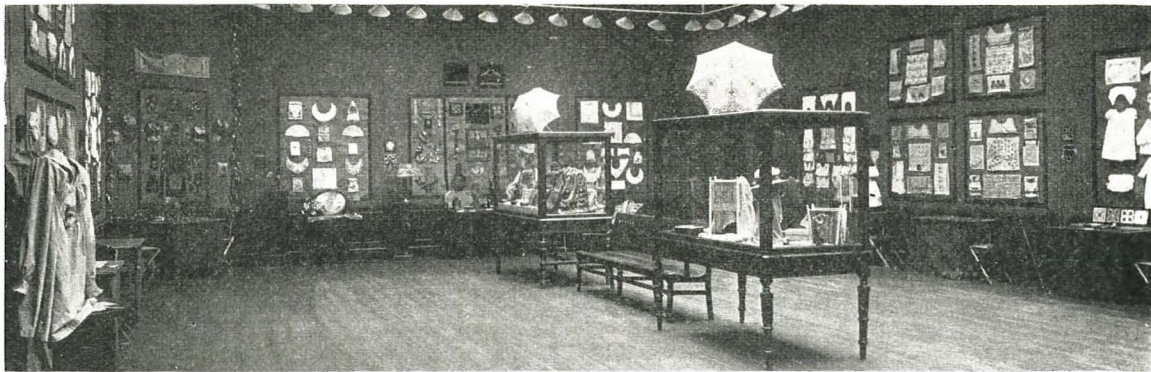
The display was under the direct supervision of Mr. Lester I. Dygert and of Mr. B. E. MacNary, principal of the Vocational School.

NEW YORK HIGH SCHOOLS EXHIBIT OF ART IN RELATION TO WOMEN'S WORK.

From October 12th to 18th, the galleries of the Fine Arts Building, New York City, were filled with busy groups of high school students, illustrating exactly how the crafts are now developed in girls' classes thruout the New York City High Schools. The exhibition was termed one of "Art in Relation to Women's Work."

As Dr. Haney, Director of Art in the New York City High Schools, said: "It is an exhibition designed to show in how practical a fashion the art teaching of the high schools is carried over into constructive processes. The older teaching taught an art removed in time and place from the pupil's interest. Our present instruction serves to make the pupils see that art is immediately of value in their daily life and work. This exhibition is full of designs made to be applied to dress or to the homes in which the pupils live. Color is shown in a host of different objects. It has been learned, not as a theoretical subject, but as one with lessons of value to everyone who must dress herself in good taste, properly decorate a room or set forth the goods in a shop window."

The exhibition represented work from eighteen of the City High Schools,—all the schools that have girls as pupils. It filled two large galleries with hundreds of pieces of craft work and other hundreds of beautifully executed designs. Around the walls of both galleries were small tables, equipped to allow groups of three or four pupils to demonstrate the various crafts taught in the high schools. These busy workers were centres of active interest to the crowd which thronged the exhibition. Over twenty crafts were shown, including modelling, pottery-making, china decoration, embroidery, lace making, sten-



General view of gallery of craft work. New York City High School exhibition of art in relation to Women's work.

ciling, block printing, leather tooling, and the like. Other groups of pupils showed how they had been taught to draw and design. Some illustrated the teaching of drawing by sketches from birds; other groups drew from the draped model, while still others used shells, berries and seed pods as motifs from which they derived colored patterns. Thru the galleries there paraded now and then what one of the visitors called the "Smock-frock brigade." These were girls from the Washington Irving High School who had smocked some gowns in attractive patterns of silk.

Not the least interesting phase of the exhibit proved to be the work in "draping" on the living model. This was done with silks loaned by a generous manufacturer. The pupils took turns in standing as models, while their companions with a few deft turns of material, and a few skillfully placed pins, created dresses, apparently out of nothing, before the spectators.

Said Miss Dela P. Mussey, chairman of the reception committee and member of the art department of the Morris High School: "This exhibition represents the co-operative work of all the women teachers of the high schools. Over eighty instructors have assisted. The craft-work referred to takes a variety of forms in the above schools. It is frequently done directly in connection with the study of applied design in the first high school year, and at other times is developed in craft classes conducted by the art teachers after school hours. In the greater number of cases it supplements the required work of the art course and represents the voluntary efforts of the art teachers to make their lessons serve their pupils most directly as a training in taste and skill.

"The exhibition seeks to present this craft-work not as the product of individual teacher or of school, but as the joint contribution of the associated body of instructors. It has been hung with a view to its effective presentation, without regard to the schools from which the separate exercises have come, and is offered as an earnest of the desire of the teachers, that their pupils grow in the sense of appreciation thru the creation of useful forms of fine design and skillful execution."

The School Art League, under whose auspices the exhibition was held, is a society which exists to further art teaching in the elementary and high schools of New York City. The late John W. Alexander was for years its president, while Miss Florence N. Levy is secretary. It supports eight scholarships for talented graduates of the city high schools. Four are awarded semi-annually and give the recipients one year of study in the Industrial Art courses of the New York School of Art or the School of Applied Design for Women. Four hundred bronze medals are awarded each year to the best workers in each of the workshops in the public schools. The League maintains a number of art lecture courses for high school and for elementary school pupils. It also maintains a docent or visiting teacher to assist in school-

museum co-operation, and it awards a number of medals in art yearly to high school pupils.

Said Miss Levy in speaking of the high school exhibition: "This is the fourth time the League has been privileged to assist the high schools in presenting their work to the people of the city. The League exists to forward in every way the art teaching done by these instructors, and it considers that in no other way can it give more valuable aid than in securing for them the use of these fine galleries. It is only proper that work as beautiful as this shall be exhibited under the best conditions, and the League is glad that it is now possible for the public to see that the work of pupils in the high schools is of an artistic importance which warrants its exhibition in galleries heretofore reserved for the work of our foremost painters and sculptors."

TEACHERS' CLASSES IN PHILADELPHIA.

THE BOARD OF EDUCATION OF PHILADELPHIA announces classes for teachers of elementary shopwork, to be conducted for the purpose of giving such instructors experience in the woodworking trades, in order that they may be able to direct the diversity of boys' work, which is open to their pupils.

The course is two years in length, and covers the following subjects: First year—school shop management, English, drawing, shop mathematics and wood finishing. Second year—teaching methods, vocational education, short technical course in bricklaying, concrete work and plastering, electric wiring and miscellaneous reports.

WESTERN DRAWING CONVENTION ANNOUNCED.

PRESIDENT S. J. VAUGHN of the Western Drawing and Manual Training Association has announced the dates for the 1916 convention to be May 3, 4, 5 and 6. A local committee has been formed at Grand Rapids for making all necessary preparations. The program is well under way. The headquarters will be in the Pantlind Hotel.

MR. CHRISTY EXPLAINS.

To the Editors:

In the November number you show a picture of a chair made in quantities in the Elementary Manual Training Schools of Cincinnati.

I am often suspicious of the statements made about similar work illustrated in the magazines, and I fear that others will feel the same in this case unless you add the following statement in your next issue. I ask this in order that there shall be no misunderstanding of the conditions under which similar products are made in some of our schools.

These chairs were made in an Elementary Industrial School and all parts made by machinery even to the sanding.

ELMER W. CHRISTY.

Cincinnati, O., Oct. 31, 1915.

NEW BOOKS AND PAMPHLETS

Practical Forging and Art Smithing.

By Thomas F. Googerty. 150 pages. Price \$1.00, plus postage. The Bruce Publishing Company, Milwaukee.

Readers of this magazine need no introduction to the author of this book. Mr. Googerty is recognized as a Master Craftsman in wrought iron, and his work in this material is among the best in both design and workmanship. The book describes the tools and materials used in wrought iron work, together with a description of their use. Fundamental operations in forging are described in detail, and a large number of problems suitable for school work is given. The first seven chapters deal with such work as is usually given in schools, and the last eight chapters deal with Art Smithing. In these chapters, detailed directions are given for making such articles as candle-sticks, drawer pulls, door knockers, coat and hat hooks, toasting forks, lanterns and lamps, together with Repoussé and inlaying.

The book will prove a valuable text for all schools doing forge work, as all of the processes are described in such a manner as to be understood by the novice.

Handwork as an Educational Medium.

By Philip Boswood Ballard. 228 pages. Price, \$1.00. The Macmillan Co., New York.

This is a very readable and scholarly defence of handwork as a means of education. It gives at length the biological, physiological, and psychological principles upon which handwork is based as educative work. It hardly assumes to be a new contribution to the subject, but it rather attempts to gather up, organize and present in readable form, the various sound arguments for the introduction of handwork into the school curriculum. As such, it is a valuable work especially for manual training teachers.

Readings in Vocational Guidance.

By Meyer Bloomfield. 723 pages. Price, \$2.25. Ginn & Company, Boston.

This book furnishes a small library on the subject of Vocational Guidance to date. It consists of articles and processes, written by a large number of persons prominent in educational circles. Part One deals with the viewpoint of vocational guidance; Part Two with the foundation of vocational guidance; Part Three, examples of vocational information, and Part Four, some practical aspects of vocational guidance. In bringing together in one volume this large amount of material, dealing with the subject, the author has rendered a valuable service to the cause of vocational education and guidance. The book will be a valuable addition to the library of any person engaged in the subject.

Shop Problems on Tracing Paper.

By Albert F. Siepert. 30 projects. Price, 25 cents. Manual Arts Press, Peoria, Ill.

As indicated by the title, this is a group of problems in woodwork, printed on thin paper ready for blue printing. The problems are for both benchwork and turning.

Second Course in Homemaking.

By Mabel Kittredge. 249 pages. Price, 80 cents. The Century Company, New York.

The same author prepared a book on Practical Homemaking, a book which this treatise is intended to follow and supplement. It is intended to cover quite thoroly the various phases not only of cooking, but as its name implies, also the matters of laundry work, marketing, care of children, and other problems that have to do with the home life.

Home Made Toys for Girls and Boys.

By A. Neely Hall. 217 pages. \$1.25, net. Lothrop, Lee & Shepard Co., Boston.

This volume is a veritable gold mine of suggestions not only for boys and girls who may wish to apply the

knowledge and skill which they have obtained in the manual training shop but also for the teacher who is seeking new problems and projects.

The book has this particular value, that the author has tried every toy which he suggests and has had many of them made successfully by boys and girls. The range of toys varies from the simplest paper pin-wheels and the simplest wooden toys made with the scroll saw, to aeroplanes and a large variety of electrical toys. The chapters on doll houses and doll furniture are particularly complete and interesting.

Industrial Education in Massachusetts. Bulletin 43, Massachusetts State Board of Education. This bulletin is an important reprint from the 78th annual report of the Massachusetts State Board of Education and deals with four important aspects of vocational education in the Bay State. It covers the continuation schools, teachers' training classes, vocational agricultural instruction and statistics of the state-aided vocational schools of the state.

The Loom and Spindle—Past, Present and Future. Publication 2351, Smithsonian Institute. A most interesting description of the development of weaving from pre-historic times down to the present. It will be found of particular value to teachers of sewing in household arts departments.

Worst's Best Construction Work is a new book on construction work for the lower three grades. The author is Edward F. Worst, supervisor of elementary manual training in the Chicago schools. The publishers are Atkinson, Mentzer & Co., Chicago.

Ten Lessons in Woodworking. By W. Melvin Fox. Prepared under the direction of Miss Manette A. Myers and published by the New Mexico State Board of Education, Santa Fe.

Report of the Director of Industrial Education for New Mexico, 1915. By Miss Manette A. Myers. Issued by the State Department of Education, Santa Fe, N. M. A particularly strong exposition of the possibilities of corn clubs, sewing and cooking clubs and similar organizations in country schools.

NEW YORK STATE DRAWING CONFERENCES.

THE New York State Department of Education, thru the Division of Agricultural and Industrial Education has arranged a series of conferences for teachers of the Empire State. The conferences began in October and will continue to and including April, 1916. The teachers in the conferences will discuss the subjects of drawing, handwork, elementary manual training and other subjects along this line.

The drawing conferences for the year 1915-16 are:

- October 9, 1915—Board of Education—Utica.
- October 16, 1915—High School—Oneonta.
- October 23, 1915—High School—Albany.
- October 30, 1915—High School—Jamestown.
- Nov. 6, 1915—High School—Malone.
- Nov. 13, 1915—Academy—Kingston.
- Jan. 15, 1916—High School—Yonkers.
- Jan. 29, 1916—School of Arts and High School—Saratoga Springs.
- Feb. 19, 1916—Rochester.
- Feb. 26, 1916—Central High School—Syracuse.
- Mar. 11, 1916—High School—Binghamton.
- Mar. 18, 1916—High School—Hornell.
- Mar. 25, 1916—Dexter.
- Spring, 1916—Mineola.
- Apr. 22, 1916—Buffalo.

Teachers will give special attention to the study of color and design and special emphasis will be given these topics in the conference program. It is planned to have teachers actually work out problems or lessons at some time during the meeting, in which case the officers will provide materials with which to work.

NOW, ARE THERE ANY QUESTIONS?

Readers are urged to ask questions concerning the Industrial Arts. The editors will reply to those questions which they feel that they can answer, and to other questions, they will obtain replies from persons who can answer them authoritatively.

Questions should be addressed to THE EDITORS.

Leather Finish.

Mt. Pleasant, Ia. Q:—Would you kindly give me a good method for putting a leather finish on a cypress library table top in your next issue if possible—one that can be used with success in a Manual Training Shop?—*L. C. H.*

A:—We assume that you wish to know how to put on a leather cover on the table rather than a leather finish. We know of no method of putting a leather finish on cypress. Having determined the kind of leather to be used as a cover secure either the leather or probably an imitation leather large enough for the purpose. First put on a pad of felt. This may be glued to the table top with ordinary glue, and after drying, the leather may be glued to the table making a firm flat cover for the table. Stretch over the top and tack on the surface with upholsterers' tacks. In gluing on either leather or imitation, apply the glue to the felt or table top and starting from the middle, stretch the leather in all directions.

Caring for Brushes.

Flagstaff, Ariz. Q:—I have experienced some difficulty in obtaining a satisfactory method of caring for my paint, varnish, shellac and other brushes. Can you give me the name of some firm which sells especially designed cans to care for brushes in such a way that the bristles will not become mis-shaped, that is which provide some supporting device for the brushes?

I have also had difficulty in obtaining a can that will prevent the varnish from crusting over and at the same time that can be used at odd intervals for applying varnish. How can this be prevented? Can you recommend a varnish brush that will not shed its bristles?—*E. E. R.*

A:—The Orr & Lockett Co., Chicago, sell cans especially designed to care for brushes in the way described. They also furnish a covered can for varnish and shellac, which prevents their evaporating and becoming crusted on top. A little turpentine poured on top of the varnish will also prevent the formation of a crust.

It is sometimes difficult to find a brush that will not shed its bristles. New brushes should be thoroly passed back and forth on the hand and loose hairs pulled out before using. A first class brush should not shed its bristles, and any first class manufacturer should be able to furnish such brushes.

Fuming Stains.

Concord, Cal. Q:—Will you kindly furnish me with the formula for the Walnut Water Stain referred to in the article, "Fuming" in the September number of your MAGAZINE? Also, the formula for the Fumed Stain in the same article?—*W. M. K.*

A:—The Fumed Walnut Stain is applied as follows: Coat the sap with a solution of Bichromate of Potassium. Sandpaper when dry. Then give the work a coat of Walnut Crystals dissolved in water. Shellac and wax.

The following formula may be used for an Oil Fumed Stain:

- 10 parts Crude Carbolic,
- 5 parts Gilsonite,
- 1 part oil Black.

Dissolve the Gilsonite and the oil Black in Bensol, separately. Then add to Carbolic. Shellac and wax.—*J. M. Dorrans.*

Copper and Brass Work.

New Haven, Conn. Q:—Can you give me information concerning booklet on copper and brass work for instruction in public schools?—*H. B. S.*

A:—For your use we would suggest "Copper Work" by A. F. Rose. The book is published by Atkinson, Mentzer & Company, Chicago, at \$1.50.

Drafting Course.

Pontiac, Ill. Q:—Have you any printed matter available suggesting the best high school course in drawing for a boy who plans to take up Electrical Engineering? He has had one year of mechanical drawing, and is very anxious to take up the study of electrical drawing at once.—*J. B.*

A:—Boys often get a mistaken notion that Electrical Engineering consists entirely in the drawing of electrical machinery, when as a matter of fact, the drawing of electrical machinery is a very small part of the course for Electrical Engineers. If the boy intends to enter the electrical engineering college, it would be well for him to pursue a thoro course in fundamental principles of mechanical drawing while in the high school. His concern should be to see that his high school course will initiate him in good standing to the University, and when he takes up the University work he will receive the necessary instructions in drawing. The drawing of electrical machinery does not differ greatly from that of drawing other machinery.

Books on History of Arts and Crafts.

Williamsport, Pa. Q:—Kindly give me several good textbooks for use in teaching history of arts and crafts to girls in the high school. *I. A. F.*

A:—The following books are suggested for use in teaching history of arts and crafts:

Line and Form. By Walter Crane. \$2.25. Macmillan Co., New York.

Bases of Design. By Walter Crane. \$2.25. Macmillan Co., New York.

Design in Theory and Practice. By E. A. Batchelder. \$1.75. Manual Arts Press, Peoria, Ill.

Artist's Way of Working in Various Handicrafts. By Russell Sturgis. 2 Vol., \$5. Dodd, Mead & Co., New York.

Architecture, Industry and Wealth. By Wm. Morris. \$2.25. Longmans, Green & Co., New York.

Classroom Practice in Design. By J. P. Haney. \$0.50. Manual Arts Press, Peoria.

Plans for a Canvas Covered Canoe.

Asbury Park, N. J. Q:—I am a manual training teacher in Asbury Park, and have been unable to procure plans for a 16 ft. canvas covered canoe. Can you tell me where I might get them? How is the form made for bending the ribs?—*W. J. B.*

A:—Plans for canvas canoes may be purchased from a number of firms making blueprints. A list will be found in the Industrial Arts Directory in this issue of the Magazine. Instructions for making a canvas canoe will also be found in the following books:

Canvas Canoes and How to Build Them. By F. E. Field. The Forest & Stream Publishing Company, N. Y.

How to Build a Canvas Canoe. By A. Neely Hall. Lothrop, Lee & Shepard Co., Boston.

Manual Training Toys for the Boys Work Shop. By H. W. Moore. Manual Arts Press, Peoria, Ill.

Other good books are *Canvas and Canoes* by A. R. Bond and *Manual of Canvas Canoes* by F. R. Webb.—*W. C. B.*

Book on Architectural Drawing.

OELWEIN, IA. Q:—Will you please give me the name and publisher of a book dealing with the practical side of architectural drawing for small buildings covering blue print work, estimating of labor, strength of materials, tables and rules, etc.?—*A. H. J.*

A:—Write to the Radford Architectural Company, Chicago, Illinois, for a list of books on these subjects. You will find their encyclopedia covers all of these subjects in one volume.